Purdue University Calumet

Graduate and Undergraduate

Catalogue

1991 - 1993

Pride of Purdue Convenience of Calumet

UP30 PF6

Graduate and Undergraduate Catalogue 1991–93

On the cover:

At the 25th commencement of Purdue University Calumet in May 1991, ***Chancellor James Yackel*** *(Ph.D. 1964) congratulates* ***Marita Wishart,*** *who receives her master's degree in English.* ***Professor Carmen L. Torres-Robles*** *(Ph.D. 1988) of the Department of Foreign Languages and Literatures looks on with* ***Marc Malone****, a master's degree candidate in communication.*

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Questions and concerns regarding University policy and practice or protection afforded individuals against discrimination should be directed to:

Ralph Ocon
Office of Affirmative Action/Equal Employment Opportunity
Purdue University Calumet, Hammond, Indiana 46323

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About Purdue University Calumet

Purdue University Calumet is a comprehensive university dedicated to serving the professional, cultural, and general educational needs of the citizens of Northwest Indiana. The university provides programs that meet the professional, cultural, and general education needs of the citizens and communities. Its academic programs lead to certificates and associate, baccalaureate, and master's degrees. Drawing upon the university's considerable computer resources, the faculty attempts to provide students with both technical skills and awareness of the social and ethical implications of new technology.

PUC's outreach activities include interactions with local school systems, governments, human services agencies, businesses, and industries—interactions ranging from continuing education and special training to professional assistance from faculty/staff/students.

Purdue University Calumet is a community committed to people as its most important resource. The institution strives to foster cultural diversity and to provide a supportive environment where students, staff, and faculty can grow and thrive, through:

- an hospitable atmosphere for a student body of diverse career goals and ethnic backgrounds, old and young, of both sexes and all races
- a faculty and staff reflecting cultural diversity
- academic consideration of cultural differences
- public programs featuring diverse speakers, performers, and programs
- affirmative action hiring and student recruiting
- outreach to public schools with minority students representing the broad range of citizens of the Calumet region.

Purdue Calumet encourages all who are qualified or qualifiable to attend, by:

- placing a primary emphasis on educational activities
- offering pre-college course work
- offering reasonable in-state tuition rates, with state support paying for two-thirds of the cost of education
- offering financial aid
- providing strong student support services
- scheduling classes to facilitate the teaching/learning process
- offering flexible courses, scheduling, and sites
- emphasizing lifelong learning.

Purdue Calumet is a partner with the region it serves, both by helping citizens and institutions of the region and by garnering support from them to maintain the university's strength.

From an early presence in Northwest Indiana in the 1920s to an extension of Purdue West Lafayette during World War II, Purdue University Calumet has progressed to a comprehensive institution of higher education, enrolling over 8000 students and offering more than eighty associate, bachelor's, and master's degree programs in sixteen academic departments. Located on a 180-acre wooded parcel of land in the residential Woodmar district of Hammond, Indiana, the commuter campus includes twelve buildings and features some of the finest small university computing facilities in the country.

As one of the regional campuses of the world-renowned Purdue University system, Purdue University Calumet awards its own degrees on the undergraduate level, through a grant of academic autonomy within the Purdue system in 1974. Thus, Purdue Calumet is able to offer programs specifically designed to suit the special needs of the citizens it serves.

As part of the Purdue system, Purdue Calumet subscribes to the university-wide principles of serving a culturally diverse citizenry:

"Purdue University is committed to the development and nurturing of a racially, socially, and religiously diverse community. The University believes that cultural variety stimulates creativity, promotes exchange of ideas, and enriches life.

"Purdue University is committed to maintaining a community which recognizes the inherent worth and dignity of every person, fosters tolerance, sensitivity, understanding, and mutual respect among its members, and encourages each individual to strive to reach his or her own potential. The University also accepts the responsibility of serving as a positive example and helping to prepare men and women who will make a lasting contribution to society." (Purdue University Statement of Principles, 1989)

Mission

"Purdue University Calumet espouses the spirit of the land-grant university tradition and is especially dedicated to the service of the people of northwest Indiana within the charter given to Purdue University. At this time its primary mission is threefold:

- to provide its students with a liberal education that will prepare them for life and the professions;
- to provide career-oriented studies that lead to certificates, associate degrees, baccalaureate degrees, and master's degrees;
- to provide programs that meet the professional, cultural, and general educational needs of the community." (from the Purdue University Calumet Mission Statement)

Organization

A single Board of Trustees governs the entire Purdue University system through the President of the University. The Chancellor of Purdue University Calumet is the senior administrative officer on campus and reports to the President of the University at West Lafayette.

Serving the Chancellor are three vice-chancellors:

The Vice-Chancellor for Administrative Services is responsible for the business affairs of the university.

The Vice-Chancellor for Student Services oversees the many services that the university provides to assure student success on campus.

The Vice-Chancellor for Academic Affairs administers academic programs. Those programs include three academic schools and the graduate school:

The School of Liberal Arts and Sciences

The School of Liberal Arts and Sciences provides educational opportunities and degree programs which lead to an understanding of the physical and natural sciences, social sciences, and the history, literatures, languages, and art of human societies and culture. The school's offerings provide both a broad liberal education and career preparation.

In the School of Liberal Arts and Sciences, the academic departments are:

- Department of Behavioral Sciences
- Department of Biology
- Department of Chemistry and Physics
- Department of Communication and Creative Arts
- Department of English and Philosophy
- Department of Foreign Languages and Literatures
- Department of History and Political Science
- Department of Mathematics, Computer Science and Statistics

The School of Professional Studies

The School of Professional Studies provides professional programs for the academic, social, and economic enrichment of students enrolled in its programs and to meet the needs of employed professionals.

In the School of Professional Studies, the academic departments are:

- Department of Construction Technology
- Department of Education
- Department of Electrical Engineering Technology
- Department of Engineering
- Department of Information Systems and Computer Programming
- Department of Management
- Department of Manufacturing Engineering Technologies and Supervision
- Department of Nursing

The University Division

The University Division offers to students in need of further academic skill development or those who are undecided about their majors counseling and course work before entry into the School of Professional Studies or the School of Liberal Arts and Sciences and their respective majors.

The Graduate School

The Graduate School's mission is to provide liaison with the Purdue University West Lafayette Graduate School through the Purdue Calumet Assistant Vice-Chancellor for Academic Affairs, who works with individual departments to coordinate graduate affairs.

Accreditations

Purdue University Calumet holds accreditations from

- North Central Association (NCA)
- Technology Accreditation Commission, Accreditation Board for Engineering and Technology (TAC-ABET)
- Accreditation Board for Engineering and Technology (ABET)
- National Council for Accreditation of Teacher Education (NCATE)
- Teacher Training and Licensing Advisory Committee of the Indiana Department of Education
- Indiana State Board of Vocational and Technical Education (ISBVTE)
- National League for Nursing (NLN)
- Indiana State Board of Nursing Education and Registration (SBNER)
- American Chemical Society (ACS)

Admission to the University

The University Admissions Office, Lawshe Hall, will be glad to arrange for a tour of campus, for information on the university, or for pre-admission counseling on how to become a student. Students can write to:

Office of Admissions
Lawshe Hall, Room 130
Purdue University Calumet
Hammond, Indiana 46323
Phone: (219) 989-2213
toll-free within Indiana 219 area code, 1-800-228-0799
for Calumet City, Illinois, 862-5690

General Admission Requirements

Beginning Degree-Seeking Students

Students must complete an application for admission, submit their high school transcript, and submit results either from the College Board Scholastic Aptitude Test (SAT) or American College Test (ACT).

Exception: For applicants who are 23 years of age or older, appropriate placement test results from the University's Skills Assessment Center will substitute for SAT or ACT scores.

The requirements for admission vary among the different schools and departments. High school and GED graduates with a minimum of 15 units of credit are eligible for admission to an academic school at Purdue Calumet. See the chart on p. 9 for further information on admissions requirements to various programs.

Admission to University Division or a preparatory or pre-major program. Applicants who do not meet the quality rank requirements for a particular program may be offered admission to a preparatory or pre-major program or to the Developmental Program offered by the University Division, depending on background and preparation. Some developmental courses do not carry college credit.

Students enrolling in the Developmental Program of the University Division will be admitted to a degree program after they successfully complete the required skill-building courses and meet grade-point and course requirements of the programs to which they apply. See p. 118 for information about the University Division.

Degree-Seeking Transfer Students

An applicant transferring from another college or non-Purdue campus must submit an application for admission with official high school and college/university transcripts from each institution attended. Applicants with fewer than 15 semester credits earned must submit results of SAT or ACT.

Exception: Applicants with more than 15 credits but without grades in English composition or mathematics may be required to provide other test scores as well.

Transfer credit is established through these procedures:

1. Purdue University Calumet accepts all credit from regionally accredited institutions for 100 level or greater classes in which the student has received a grade of C or better.
2. Transfer students must have a C average and appropriate subject matter preparation to be admitted to a degree-seeking status. Transfer applicants who do not have a C average or who fail to meet the subject matter requirements may be eligible to enroll in a preparatory program.
3. Credit earned at other accredited institutions will be evaluated in terms of how it fills the graduation requirements at Purdue Calumet.
4. Transfer credit from community colleges which are not regionally accredited will be considered in the same way as credit from accredited colleges ONLY for students who score an average of 500 or better on the 5 sections of the College Level Examination Program (CLEP) general examinations administered by the College Board.
5. After admission, transfer courses will be evaluated on an individual basis to see how credit meets Purdue University Calumet graduation requirements.
6. Purdue University Calumet accepts a maximum of 90 credits from other colleges and universities.
7. **Transfer to a Bachelor of Science in Technology program**. A transfer applicant from a non-Purdue campus who wishes to enter one of Purdue Calumet's bachelor of science programs in technology must have an appropriate associate's degree, equivalent to an associate's degree in technology, to be admitted at the junior level. Students transferring into programs accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology from programs not so accredited are required to pass departmental placement exams to establish transfer credit.

   Transfer students may be admitted to these programs without appropriate associate degrees but may be required to take additional courses to fulfill the bachelor of science degree requirements.

Students Re-entering Purdue University Calumet

Purdue Calumet students who have not attended for one year or longer but who were in good academic standing when they left should submit a re-entry application at least three weeks prior to registration.

Those applicants who have attended another college or university must submit transcripts of the work they have completed since their last attendance at PUC. Re-entry status is determined by the individual department. Students are notified of their approval for re-entry with an Offer of Admission.

Degree-Seeking Transfer Students from Other Purdue Campuses

Students who have attended or are currently attending another campus in the Purdue system may transfer to Purdue Calumet by filing a regional-campus-transfer application available either at the Purdue Calumet Admissions Office or the registrar's office of their original Purdue campus.

Admissions Decisions

The Office of Admissions will evaluate applications and make one of the following determinations:

1. **Regular admission**. The applicant has met all conditions for admission to the school, department and curriculum specified in the Offer of Admission.
2. **Admitted on Probation**. The applicant has a previous college record showing academic probationary status, but will be permitted to take courses at Purdue Calumet.
3. **Admission Denied**. The applicant will not be admitted to the university until adequate background and preparation for university work can be demonstrated.

4. **Admission Deferred**. The university is unable at the present time to admit the student because of lack of resources.
5. **Admission Incomplete.** The applicant has not forwarded all the information or documentation necessary for the Office of Admissions to determine eligibility.
6. **Admission Pending**. Further information will be required at a later time, such as final grades from a semester currently in progress.

Non-Degree-Seeking Students

Purdue Calumet welcomes students pursuing studies for personal or professional enrichment. Students not pursuing a degree are admitted as non-degree-seeking students and may be admitted in the following circumstances:

1. **Adult Learners**: Adults with special interests and expertise who are enrolling for personal enrichment. Transcripts of credits and SAT scores are recommended but not required.
2. **Students applying for the Certificate in Supervision**: See p. 110 for further information. Transcripts of credits and SAT scores are recommended but not required.
3. **Students applying for Post-Baccalaureate Certificates in Information Systems and Computer Programming and in Writing**: Transcripts from accredited institutions of higher education are required to verify receipt of an appropriate bachelor's degree. See pages 99 and 84-5 for further information.
4. **Company Employees**: Employees of local businesses and industries who need further education in specific areas may enroll in selected courses with the recommendation of their employers. Transcripts of credits and SAT scores are recommended and may be required for advising purposes.
5. **High School Students**: High school students must meet the University's admission requirements as determined by the student's rank in class, test scores and strength of college preparatory program. High school students may take courses for credit at Purdue Calumet in two different circumstances:
   Concurrent enrollment. Seniors interested in earning college credit while still enrolled in high school should contact their guidance counselor for a concurrent enrollment application.
   Rule Ten Program. Students who have completed a minimum of 4 semesters of high school and who are interested in using their college credits to meet high school graduation requirements should contact their high-school guidance counselor for a Rule Ten Enrollment Application.
6. **Transient college students**: Students pursuing degrees at non-Purdue campuses who wish to enroll for one semester must submit either a letter of good standing or their most recent transcript showing good academic standing from their home institutions.

Non-degree students who later wish to pursue degrees must apply for degree-seeking admission and are subject to admissions and degree requirements in effect when they are accepted.

Admission to the Honors Program

Purdue Calumet's Honors Program offers gifted students academic recognition, the opportunity to work closely with uniquely talented faculty, and courses designed to develop skills, creativity, and the richness of their educational experience. The Honors Program enhances the process of education with seminar-like classes designed to stimulate, challenge, develop, encourage and excite students in their zest for learning.

Eligibility. Freshmen or sophomores are invited into the honors program based on combined SAT scores and rank in high school graduating class or grade point average in Purdue Calumet classes.

Requirements. As part of the regular degree requirements of various programs at Purdue Calumet, honors students must complete the following courses:

l. In the freshman or sophomore years:

IDIS 102 Honors Seminar I
IDIS 103 Honors Seminar II

2. At least twelve hours of honors courses in the student's major

3. A three-credit senior project

4. Minimum cumulative grade point average of 5.0

Students who satisfy the requirements of the honors program as part of their departmental graduation requirements will receive at graduation the notation of honors on their transcripts.

Additional information is available from the Office of Admissions or academic advisors.

Advance Credit and Advanced Placement

Advance credit means that the university grants credit based on other outside academic work and records it on the student's record.

Advanced placement means that a student is placed in an advanced level course but may not have earned credit toward a degree for any prior courses. The Office of Admissions evaluates requests for advance credit and advanced placement.

There are four ways for a student to establish advance credit or advanced placement:

l. Departmental credit by exam—an individual department may establish an examination procedure to establish advance credit. Students should consult with the course department's head or academic advisor for details.

2. Departmental Credit without Exam—may be awarded on the basis of substantially equivalent experience or successful completion of a more advanced course. Students should consult with the course department's head or academic advisor for details.

Departmental Credit in Mathematics, Computer Science, and Statistics—Students may submit an application to the department for credit in basic mathematics courses numbered 135 or above only if:

- the basic course satisfies the mathematics requirement for the student's curriculum;
- the student is currently taking or has completed a subsequent course in the normal sequence of math courses in the department;
- the student has never received a grade other than "W" in the basic course.

3. College-level Examination Program (CLEP)

CLEP exams evaluate non-traditional college-level education, such as independent study, correspondence work, or credit earned at a non-accredited institution. Purdue credit may be established by taking the subject matter examinations shown on the next page.

CLEP SCORES REQUIRED FOR EQUIVALENT PURDUE UNIVERSITY CALUMET CREDIT

CLEP Subject Exams	Purdue Equivalent	Credit Hours	Scores Required
Accounting, Introductory	MGMT 200	3	45+
American History I	HIST 151	3	50+
American History II	HIST 152	3	50+
Biology, General	BIOL 101 & 102	8	48+
Bus. Management, Intro to	MGMT 101	3	45+
Calculus, w/Elem. Functions	MA 163 & 164	10	55+
Chemistry, General	CHM 111 CHM 111/112 CHM 115 CHM 115/116	3 6 4 8	50+ 65+ 55+ 70+
College Algebra/Trig.	MA 151	5	57+
English Composition with Essay*	ENGL 104	3	450-500
Human Growth/Development	CDFS UND	3	45+
Micro/Macroeconomics, Intro to	ECON 210	3	47+
Psychology, General	PSY 120	3	60+
Sociology, Introductory	SOC 100	3	45+
Statistics	PSY 500	3	45+
Western Civilization I	HIST 110	3	50+
Western Civilization II	HIST 104	3	50+

4. College Board Advanced Placement Program

Advance credit is awarded to students who have successfully completed college-level work in high school or through other non-traditional, college-level educational experiences. Students can establish credit at the completion of the Advanced Placement Course in high school, as outlined below:

ADVANCED PLACEMENT AND ADVANCED CREDIT

Subject Area	Advanced Placement Score	Purdue Credit Granted
Biological Sciences	4 or 5	8 sem. hrs.
Chemistry	3 4 or 5	3 sem. hrs. 8 sem. hrs.
English Language and Composition*	3, 4, or 5	3 sem. hrs.
History: American European	 3, 4, or 5 3, 4, or 5	 6 sem. hrs. 3 sem. hrs.
Math	3 4 or 5	5 sem. hrs. 10 sem. hrs.
Modern Languages	3 4 5	6 sem. hrs. 9 sem. hrs. 12 sem. hrs.
Physics	3, 4, or 5	4 sem. hrs.

* Students must also pass English Proficiency Exam required for graduation.

ADMISSION REQUIREMENTS

School	Program	Quality Rank*	Mathematics	Lab Science	English	Foreign Language	History or Social Studies
Liberal Arts and Sciences[1]	Agriculture Forestry	Upper 2/3	3 sem. Algebra 2 sem. Geom. 1 sem. Trig.	4 sem. Biology, Chemistry or Physics	8 sem.	None	2 sem.
	Associate of Arts	Upper 1/2	2 sem. Algebra 2 sem. Geom.	2 sem. Biology, Chemistry or Physics	8 sem.[2]	None	2 sem.
	Behavioral Sciences Com. & Creative Arts English & Philosophy Foreign Lang. & Literatures History & Political Science	Upper 1/2	2 sem. Algebra 2 sem. Geom.	2 sem. Biology, Chemistry or Physics	8 sem.[2]	4 sem.	2 sem.
	Biology Chemistry Mathematics Physics	Upper 1/2	3 sem. Algebra 2 sem. Geom. 1 sem. Trig.	2 sem. Biology, Chemistry or Physics	6 sem.	None	2 sem.
	Early Childhood Development	Upper 2/3	2 sem.	2 sem. Biology, Chemistry or Physics	6 sem.	None	2 sem.
	Consumer & Family Science Food Service & Lodging Supervision	Upper 1/2	2 sem. Algebra[3] 2 sem. Geom.	2 sem. Biology, Chemistry or Physics	6 sem.	None	2 sem.
	Chemical Technology Pre-Vet Science	Upper 2/3	2 sem. Algebra 2 sem. Geom.	2 sem. Biology, Chemistry or Physics	6 sem.	None	2 sem.
Professional Studies[1]	Architectural Tech.[7] Civil Engr. Tech. Computer Engr. Tech. Computer Programming Electr. Engr. Tech. Indust. Engr. Tech Mech. Engr. Tech. Supervision	Upper 2/3	2 sem. Algebra 2 sem. Geom.	2 sem. Biology, Chemistry or Physics	6 sem.	None	2 sem.
	Education	Upper 1/2	2 sem. Algebra 2 sem. Geom.	2 sem. Biology, Chemistry or Physics	8 sem.[2]	4 sem.	2 sem.
	Engineering	Upper 1/2	3 sem. Algebra 2 sem. Geom. 1 sem. Trig.	2 sem. Biology, Chemistry or Physics	6 sem.	None	2 sem.
	Management	Upper 1/2	3 sem. Algebra 1 sem. Geom. 1 sem. academic math	2 sem. Biology, Chemistry or Physics	6 sem.	None	2 sem.
	A.A.S. Nursing	Upper 1/2	2 sem. Algebra[4] 2 sem. Geom.	4 sem. Biology[5], Chemistry or Physics	6 sem.	None	2 sem.
	B.S. Nursing (PNT option only)	Successful Completion of Associate Degree of Diploma Program in Nursing with R.N. Licensure					
University Division[1,6]	Developmental Pre-Major	Lower 1/2	No Specific Subjects Required				

* Quality rank is determined by considering a combination of class rank, grade point average, grade average in subjects related to degree objectives, trends in achievement throughout high school, satisfying high school subject matter requirements, strength of college preparatory program, and standardized test results. Graduation from an accredited high school with a minimum of 15 units of credit is required.

1. Upper-half quality Liberal Arts and Sciences and Professional Studies applicants may be admitted with no more than four semesters of subject deficiency. Applicants with more than two units of deficiency may be admitted to a pre-major (non-developmental) program in University Division. Graduates of non-accredited high schools and GED graduates are also eligible for admission.
2. Applicants with SAT Verbal scores of 550 or higher will be admitted with a minimum of six semesters.
3. May be two semesters of algebra and two semesters of geometry, or four semesters of algebra, or other combination approved by the Office of Admissions.
4. May substitute additional two semesters of lab science for two semesters of geometry.
5. Must include two semesters of chemistry.
6. Applicants with a combined verbal and mathematics SAT score of less than 500 must score above average on the University Division achievement tests to qualify for admission.
7. All beginning students must take the PUC Math Placement Test. Based on the results, students may be required to take an intermediate algebra course before their first required math course for the degree.

Fees and Financial Aid

Tuition and fees are set annually by the Purdue University Board of Trustees and are subject to change without notice. Because these charges are approved each year, the tuition and fees listed below apply only to the 1991-92 academic year.

Tuition 1991-92

Resident Undergraduate fee per credit hour . . . . . $ 64.00
Nonresident Undergraduate fee per credit hour $161.25
Resident Graduate fee per credit hour . . . . . $ 83.50
Nonresident Graduate fee per credit hour $189.90
Laboratory fee per credit hour . . . . . $ 21.50
Registration for examination only . . . . . $ 68.00
Registration for degree only . . . . . $ 68.00

Fees

Regular Charges

Application Fee for Graduate School . . . . . $ 25.00

Undergraduate Student Service fee
$2.35 per credit hour to a maximum of . . . . . $ 32.50
(Optional for all graduate students)

Parking Fee—Based on the number of credits for which a student registers:
Students enrolled in nine or more hours . . . . . $ 30.00
Students enrolled in eight or less hours . . . . . $ 15.00

Unusual Charges

Late Registration Fees. For students who register after classes begin, an additional $7.00/course to a maximum of . . . . . $ 35.00

Readmission Fee . . . . . $ 50.00

Those students dropped by the University for academic reasons are assessed a fee before application for readmission will be processed.

Breakage Fees. Usually included in course fees for the cost of normal breakage and wear and tear on equipment. An additional charge will be levied against individuals for excessive waste, loss or breakage, to be paid before course credit will be given.

Service Fee.

For Replacement of Student Service Fee Card . . . . . $ 5.00

Encumbrance Fee . . . . . $ 5.00

If a student fails to fulfill any financial obligation to any University department, the student's records will be frozen or encumbered and the fee assessed to the student. Students will be notified in writing of the outstanding obligation and will be given a specified time to settle the account prior to assessing the fee.

A frozen or encumbered record means that:

- the student may not be allowed to register for more courses
- the student's transcript may not be released until the account is settled.

Refunds

Tuition and course fees will be refunded by date of withdrawal from the course:

100%	first week of classes
60%	second week of classes
40%	third week of classes
20%	fourth week of classes

No refund will be given for courses dropped after the fourth week of the semester. Students whose registration is cancelled by the Dean of Students for disciplinary reasons will receive refunds based on this same schedule.

Refunds of deposits on equipment are subject to regular service and breakage charges.

Classification of Students as Resident or Non-Resident

The assessment of tuition and fees for a given semester is based on the student's residence classification on the first day of classes for that semester. Students who are not classified as residents of the State of Indiana are required to pay non-resident tuition. Students' residence classification continues in effect for subsequent semesters unless and until the classification is changed.

Responsibility for Residence Classification. The director of admissions or a designee determines the initial residence classification of undergraduate students at the point that the student is admitted or re-enters the University. The Assistant Vice Chancellor for Academic Affairs or a designee determines the initial residence classification of each graduate student at the time the student enters or re-enters the university. All reclassifications of residence are determined by the registrar or a designee.

Any of these authorities is authorized to require certificates, affidavits, documents, or any other evidence they deem necessary. The burden of proof is always on the student making a claim to resident student status. Students who have further questions about residency classification may request a brochure from the offices of any of these authorities.

Changes in Residence Classification for Tuition Purposes. Either the student or the university may initiate an inquiry of residency classification. The non-resident student has the responsibility to apply to the registrar for reclassification if the student believes that changes in the situation justify reclassification.

To apply for a change: The student must apply in writing, using a form available from the registrar, at any time after the requirements for domicile have been met, but no later than fifteen days after the start of classes for the semester in which reclassification is sought.

The registrar will make a decision no later than thirty days after the completed application is filed.

Penalties for Failure to Provide Adequate Information. A student who fails to notify the University of a change of facts or provides false information which might affect classification or reclassification from resident to non-resident status will be required to pay retroactively any tuition fees which would normally have been assessed.

The student who provides false information or conceals information to achieve resident status may also be subject to disciplinary action as well as other penalties under the law.

Residence Classification Review. A student who is not satisfied with his residence classification can request a reconsideration by the officer who made the classification. Such a request must be made within fifteen days after the receipt of written notification of the official decision.

Financial Aid

To help students meet the costs of their education, Purdue University Calumet provides financial assistance to needy students. The purpose of the Office of Financial Aid is to help students meet educational costs beyond those which they and their families are able to contribute.

There are three types of financial aid for college students available from federal, state, and university programs:

1. Grants or scholarships, which do not have to be repaid
2. Loans, which must be repaid
3. College work-study programs, where the student earns money.

To apply for financial aid a student must:

1. Apply for admission to Purdue University Calumet as a degree-seeking student. Financial aid through the University is not available for non-degree students.
2. Apply for financial aid by submitting a Financial Aid Form (FAF) through the College Scholarship Service. This form is available through high school guidance offices and the Purdue Calumet Office of Financial Aid.

On the Financial Aid Form (FAF):

1. Designate Purdue University Calumet, No. 1638, as recipient of the FAF analysis.
2. Check the appropriate box for Federal Financial Aid Programs.

For Indiana Residents Only: Designate the State Student Assistance Commission of Indiana as recipient of the analysis in order to apply for the State Higher Education Award and Lilly Endowment Educational Award.

The analysis of the information provided on the form allows the University to evaluate student need for aid. If the student is eligible, the University will put together a "package" of aid to help meet the student's educational expenses. Students receive an Award Notification from the Office of Financial Aid and must return the Financial Aid Acceptance Form to indicate whether they accept the types of funds awarded.

Once a student registers for classes, a bill is generated and mailed to the student. The student must then report to the Bursar's Office to have the financial aid applied to tuition and fees.

If the financial aid amount is greater than tuition and fees, the student will receive a check for the difference.

Important Dates

January 1–March 1: File the Financial Aid Form (FAF) with the College Scholarship Service for priority consideration. Students filing after March 1 may apply only for a Pell Grant by completing the Financial Aid Form or an application for Federal Student Aid. Students filing late will be considered for campus aid as they complete their files, depending on qualifications and available funds.

June: Award Notifications will be sent out to all applicants with complete files.

Regulations for Maintaining Financial Aid

Satisfactory Academic Progress

Financial aid recipients must make satisfactory academic progress toward a degree. A student's satisfactory academic progress is determined by the number of credit hours completed each semester, the student's Graduation Index, and the total number of credit hours the student has registered for while attending Purdue Calumet.

Credit Hour Requirement: Students must complete a minimum number of credit hours each semester with a grade of D, P, S, or better. The number of credit hours they must complete is based on their enrollment status at the end of the first week of classes (end of the 100% Refund Period).

If you register for:	You must complete:
12 credit hours or more (full-time)	At least 12 credit hours
9-11 credit hours (3/4 time)	At least 9 credit hours
6-8 credit hours (1/2 time)	At least 6 credit hours

Graduation Index Requirement: Students who have attended at least four semesters must maintain grades consistent with Purdue Calumet's Graduation Index to continue receiving financial aid. See p. 21–23 for graduation requirements.

Time Requirement: Students must earn degrees in a timely way to continue to receive financial aid.

If you register for:	And are pursuing the:	The maximum number of semesters for financial aid is:
12 credit hours or more (full-time)	Bachelor's Degree	10
9-11 credit hours (3/4 time)	Bachelor's Degree	14
6-8 credit hours (1/2 time)	Bachelor's Degree	20
12 credit hours or more (full-time)	Associate Degree	6
9-11 credit hours (3/4 time)	Associate Degree	8
6-8 credit hours (1/2 time)	Associate Degree	12

Financial Aid Probation

Students not meeting the Credit Hour Requirement during an academic year will be placed on Financial Aid Probation for the following academic year. They remain eligible to receive their financial aid.

Financial Aid Ineligibility

Credit Hour Requirement: Students on Financial Aid Probation who fail to meet the Credit Hour Requirement during their probationary period will become ineligible for financial aid the following academic year.

Graduation Index Requirement: Students who do not meet the Graduation Index Requirement are ineligible to receive financial aid until they can meet this requirement.

Time Requirement: Students enrolled beyond the time established for completion of their degree are no longer eligible for financial aid.

Students in an ineligible status should contact the Office of Financial Aid to review the steps they must follow to receive financial aid again.

Talent Awards

The Talent Award Program offers about forty merit scholarships each year ranging from $500 to $1500. Awards are based solely on academic merit; need is not a factor. Students must submit a Talent Award application to the Office of Financial Aid by March 1. To qualify:

Entering freshmen

- Must have application for admission on file by March 1.
- Must rank in top 10% of high school graduating class
  OR
- Have a minimum combined SAT score of 1200.

Eligible entering freshmen will be sent an application in early February.

Currently enrolled students

- Must have 4.5–6.0 graduation index, depending on criteria established by the donor.

The Information Center, Office of Financial Aid, and Office of Admissions have applications available in late January.

Basic Information About Aid Sources

PROGRAMS	ELIGIBILITY	DESCRIPTION	REPAYMENT	HOW TO APPLY
Pell Grant (Formerly BEOG)	Undergraduate. Minimum of six credit hour enrollment. Must show need. U.S. citizen or permanent resident.	Amount of award based upon PGI (Pell Grant Index), hours of enrollment and cost of attendance.	No repayment obligation.	Complete a Federal Student Aid application or give CSS permission to send the information from the FAF to the U.S. Department of Education.
Supplemental Educational Opportunity Grant (SEOG)	Undergraduate. Limited availability. Must show need. Minimum of 6 credit hours enrollment, U.S. citizen or permanent resident.	Program is to supplement other federal aid programs, such as the Pell Grant, if the student continues to show need.	No repayment obligation.	Complete an FAF by March 1, listing PUC, #1638, as recipient.
Indiana Higher Education Award (HEA)	Undergraduate. Resident of Indiana. Must show need. Full-time student with 12 credit hours or more.	Can be applied to tuition and fees only.	No repayment obligation.	Complete an FAF by March 1 and indicate SSACI as recipient.
Lilly Endowment Educational Award Program (LEAP)	Undergraduate. Resident of Indiana. Must show need. Must be full-time student with 12 credit hours or more.	Can be applied to tuition and fees or other educational expenses.	No repayment obligation.	Complete an FAF by March 1, and indicate SSACI as recipient.
Minority Teacher Scholarship	Undergraduate. Minority student (Black or Hispanic) enrolled full-time. Indiana resident showing financial need. Must be pursuing a degree in Education.	Dependent on need; maximum annual scholarship of $1000.	No repayment obligation.	Pick up application from the Office of Financial Aid.
Purdue University Calumet Fee Remission Scholarship	Undergraduate. Full-time student with 12 credit hours or more. U.S. citizen or permanent resident. Entering freshmen must rank in top 10% of graduating H.S. class; upperclassmen must maintain at least a 4.50 GPA.	Covers about three-fourths of student's tuition and is applicable to tuition and fees only.	No repayment obligation.	Complete an FAF by March 1, listing PUC, #1638, as recipient.
Perkins Loan (formerly National Direct Student Loan)	U.S. citizen or permanent resident. Must show need. Undergraduate or graduate. Enrolled at least half-time (6 credit hours).	Maximum $4,500 first two years; $9,000 as an undergraduate. Up to $18,000 cumulative borrowing for undergraduate and graduate/professional study.	Long-term repayment, 9-month grace period after graduation or withdrawal, 5% interest begins at time of repayment.	Complete an FAF by March 1, listing PUC, #1638, as recipient.
Supplemental Loans (for students) and PLUS Loans (for parents)	Undergraduate or graduate. Enrolled half-time (6 cr. hrs.). Loan made to parents of dependent undergraduates or to students classified as independent for financial aid purposes.	Maximum $4,000 annually.	Long-term repayment. Interest is variable not to exceed 12%. Repayment begins 60 days after disbursement unless borrower qualifies for deferment.	Obtain application from participating bank, savings and loan, credit union, etc.

Basic Information About Aid Sources, Cont.

PROGRAMS	ELIGIBILITY	DESCRIPTION	REPAYMENT	HOW TO APPLY
Robert T. Stafford Student Loan Program (formerly Guaranteed Student Loan)	Undergraduate or graduate. U.S. citizen or permanent resident. Attending a qualified institution in Indiana. Enrolled at least half-time (6 cr. hrs.). Must show need.	Maximum $2,625 for the first two years of undergraduate study, $4,000 per year for the remainder of undergraduate study, and $7,500 per year for graduate and professional students. Cumulative borrower limits of $17,250 for undergraduate study and $54, 750 for undergraduate and graduate study combined.	Long-term repayment. 6-month grace period after graduation or withdrawal. 8% interest rate begins at time of repayment. 8% interest rate for first four years of repayment and will increase to 10% for the balance of the repayment period.	Obtain application from PUC Office of Financial Aid or from participating bank, savings & loan, credit union, etc. Complete an FAF by March 1, listing PUC #1638, as recipient.
College Work-Study	Undergraduate or graduate. Must show need. Enrolled at least half-time (6 cr. hrs.).	On-campus employment arranged through the Financial Aid Office.	Not applicable.	Complete an FAF by March 1, listing PUC, #1638, as recipient.
Child of Disabled Veteran (CDV)	U.S. citizen or permanent resident. Child of a parent with a service-connected disability. Verified through the Veterans Administration. Undergraduate or graduate.	Can be applied to tuition and fees. Covers three-fourths the cost of tuition. Can be used for eight semesters.	No repayment obligation.	Obtain and complete application from PUC Office of Financial Aid.
Laverne Noyes Scholarship	Must be a descendent of a World War I veteran; show financial need.	Amount determined by the PUC Financial Aid Office. May be used for tuition only.	No repayment obligation.	Complete an FAF by March 1 listing PUC, #1638, as recipient
Vocational Rehabilitation Benefits	Undergraduate or graduate with disabilities which are or will be detrimental to obtaining employment.	Amount determined by Vocational Rehabilitation.	No repayment obligation.	Contact Vocational Rehabilitation.

Academic Regulations

Students who enter institutions of higher education agree to know and abide by the rules of their institutions. In this section of the catalog are listed some of the specific regulations which govern students and academic programs. Other regulations are listed in the *Student Handbook*. A complete set of academic regulations is available to students in the Office of the Vice Chancellor for Student Services and Dean of Students, Lawshe Hall 352.

Academic Advisors

Students are expected to know the requirements for the degrees they are studying for and to meet with their academic advisors each semester.

Majors and Degree Programs

Students choose majors and are assigned major advisors in specific schools. To change majors, students must complete Change of Degree Objective forms available in the Registrar's Office.

Registration for classes

There are three registration periods for the fall, spring, and summer sessions.

Early Registration—held in the preceding semester to allow currently enrolled students an opportunity to preregister in order to eliminate long lines and to enroll in the courses they need.

Open Registration—held just prior to the beginning of classes, for students unable to register early and for students who may need to adjust their schedules.

Late Registration—held during the first week of classes, and to allow students to change some classes. A penalty fee is charged to students who enroll during this period. See p. 10 for late registration fees.

Adding Courses

Students may add courses during the first four weeks of the semester by submitting a completed add/drop card with only the advisor's signature to the Registrar's Office. During the second, third, and fourth weeks of the semester, the instructor's signature is also required.

Dropping Courses

Students may withdraw from courses only by submitting an add/drop card with the advisor's signature to the Registrar's Office. During the ninth through twelfth weeks of the semester, the instructor's signature is also required. See p. 11 for refund information.

Lack of attendance does not constitute an official withdrawal from a course.

When the student withdraws from a course determines the recording of the course on the student's transcript.

- By the end of the third week—no record
- By the end of the ninth week—W recorded
- By the end of the twelfth week—W, WF, WN, WU as assigned by the instructor
- After the twelfth week—no withdrawals

Excessive Absence. A student may be withdrawn from a course for excessive absences by the Scholastic Readmission Committee upon recommendation of the instructor, with approval of the student's advisor and dean of the student's school. Grades of W, WF, WN, or WU may be assigned.

Grades

Students must complete all required work for courses by the last scheduled class. The only exception is if the course has been cancelled by the registrar. At the end of each semester, students will receive a grade from the instructor for each course they enroll in. The grade indicates the student's level of achievement of the objectives of the course. Grades offered at Purdue Calumet are listed below.

For Credit Courses

A—highest passing grade.

B

C

D—lowest passing grade, indicating achievement of the minimum objectives of the course

E—conditional failure, meaning failure to achieve minimum objectives, but only to such limited extent that credit can be obtained by examination or otherwise without repeating the entire course. This grade represents failure in the course unless the record is changed within one semester, by examination or otherwise. In any case, the grade cannot be changed to any other grade but a D.

F—failure to achieve minimum objectives of the course. The student must repeat the course and complete it satisfactorily in order to establish credit for it.

For courses in the pass/not pass option

P—passing grade, equivalent to A, B, or C.

N—not passing.

For zero credit courses (includes thesis research but not laboratory portions of courses which are scheduled by separate designations)

S—satisfactory; meets course objectives.

U—unsatisfactory; does not meet course objectives.

For incomplete work, credit or noncredit:

I—incomplete, no grade; a temporary record of work which was passing when interrupted by unavoidable absence or other causes beyond a student's control

An instructor may require a recommendation from the Dean of Students or a designee that the circumstances warrant a grade of I. The student must achieve a permanent grade in the course no later than the twelfth week of the second semester subsequent to the enrollment. If not, the I will become IF.

PI—incomplete, no grade; same as I for student enrolled in pass/not pass option.

SI—Incomplete, no grade; same as I for student enrolled in zero-credit course.

Other

The Registrar records the following grades and symbols in special circumstances:

W—withdrew; grade records that student was enrolled in a credit course and withdrew or cancelled the course after the third week (1-1/2 weeks in summer session).

WF—withdrew failing; grade records that student was enrolled in a credit course and withdrew or cancelled the course after the ninth week, at which time, according to the instructor, the student was not passing. This grade counts as a failing grade, and may be ordered by the Scholastic Readmissions Committee.

WN—Withdrew not passing; the same as WF for a student enrolled in a pass/not pass option, but does not affect the scholarship index.

WU—withdrew unsatisfactory; the same as WF for a student enrolled in a zero-level course, but does not affect the scholarship index.

IF—assigned by the registrar. Failure to complete an I grade by the twelfth week of the second semester subsequent to enrollment in a credit course. Counted as F in the scholarship index.

IN—unremoved incomplete and failing; failing to complete a pass/not pass course in which the student received a PI by the twelfth week of the second semester subsequent to enrollment in the course. Does not affect scholarship index.

IU—unremoved incomplete and failing; failing to complete a zero-credit course in which a student received an SI by the twelfth week of the second semester subsequent to enrollment in the course. Does not affect scholarship index.

Pass/Not Pass Option

The Pass/Not Pass option provides students with the opportunity to broaden their educational foundations with less concern for the grades they earn. Grades earned under this option are not used in computing scholarship indexes. The option is open to students according to the guidelines established for their majors.

Students may choose this option in any course which does not already appear on the academic record and in which the student is otherwise eligible to enroll for credit with a letter grade. Students choose this option when they register for the course; they cannot change to the pass/not pass option when the semester is in progress. The registrar's office will indicate which students have elected this option. A student who enrolls in a course under this option has the same obligation as one who is enrolled for credit with a letter grade.

When instructors report final grades, they report that any student who would have earned a grade of A, B, or C has passed the course, and that any other student has not passed. The registrar makes an appropriate notation on the student's academic record in place of a letter grade but does not use the course grade in computing scholarship indexes.

In addition to these regulations, the following departments have established their own rules for the types and uses of courses elected under this option.

Communication and Creative Arts, English and Philosophy, Foreign Languages and Literatures, History and Political Science, Behavioral Sciences:

1. Semester classification of three and above.
2. Graduation index of 4.00 and above.
3. Only for courses outside departmental and school requirements—for electives. Exception: RHI 301 must be taken pass/not pass for students in the RHI programs.
4. Standard registration procedures must be followed, including regulations, such as add/drop procedures, withdrawal from courses, and so on.
5. Students must indicate upon registering which courses they wish to take using the pass/not pass option.
6. Students may elect courses given in other schools under the pass/not pass option.
7. Students transferring from another school to Liberal Arts and Sciences who pass a course required by the major under the pass/not pass option will be considered, upon transfer, to have satisfied the Liberal Arts and Sciences requirements.

Biology (except Agriculture), **Chemistry and Physics** (except Chemical Technology) **Mathematics, Computer Science, and Statistics:**

1. Semester classification of three and above.
2. Graduation index of 4.50 and above.
3. Students may not use pass/not pass credits for more than 20% of the total credit hours required for graduation.

4. No more than two such courses per year. Courses taken in summer sessions apply to the year preceding the summer session.
5. Only free electives and courses in the humanities and behavioral and social sciences core may be taken under the pass/not pass option. Such courses may be used to satisfy that portion of the core only if they are more advanced than those usually elected at the student's level.

Agriculture:

1. Semester classification of three and above.
2. Graduation index of 4.00 and above.
3. No more than 21 credits of elective courses taken under the pass/not pass option will be used toward graduation.

Chemical Technology:

1. Students will not be permitted to use the pass/not pass option until the students' advisor agrees that the course is desirable for the students to take, given the students' particular situations.

Construction Technology, Electrical Engineering Technology, Information Systems and Computer Programming, Manufacturing Engineering Technologies and Supervision:

1. Students may use the pass/not pass option in any course which does not already appear on the students' academic record, and in which the students are otherwise eligible to enroll for credit with letter grade.
2. Students may not use pass/not pass credits for more than 20% of the total credit hours required for graduation.
3. Students will not be permitted to use the pass/not pass option until the students' advisor agrees that the course is desirable for the students to take, given the students' particular situations.

Education:

l. Semester classification of three and above.
2. Graduation index of 4.00 and above.
3. Students may elect the pass/not pass option only in courses outside departmental and school requirements. Exception: EDCI 498A.
4. Students may elect courses given in other schools of the university under the pass/not pass option.
5. Students transferring from another school to Professional Studies who pass a course required by the major under the pass/not pass option will be considered, upon transfer, to have satisfied the Professional Studies requirements.

Engineering:

l. This option is available to students only for general education courses.

Management:

1. Semester classification of four and above. Students with a semester classification of three may select the pass/not pass option under special circumstances only.
2. Students in Management programs may elect the pass/not pass option for no more than 15 credits total.
3. Students may take courses under the pass/not pass option only in the elective area.
4. No case courses may be taken under this option.
5. Students on academic probation must complete at least 12 credit hours with letter grades in one semester before taking courses under the pass/not pass option. Students on academic probation for a second consecutive semester may not elect the pass/not pass option until they are removed from probationary status.
6. A student may not repeat a course in which a pass grade was received for a letter grade.
7. If a student receives a not pass grade, the student may repeat the course for a letter grade.

8. Taking more than one course each semester under the pass/not pass option is strongly discouraged.
9. Students may not change the grading option of a course after the first week of a semester.

Nursing:

l. Students may elect the pass/not pass option for elective courses only.

Students in Good Standing

For reports and communications to other institutions and agencies, students are considered in good standing unless they are dismissed, suspended, or academically dropped from the University without being formally readmitted.

Scholarship Indexes

The scholastic standing of all students in programs leading to an undergraduate degree is determined by two indexes:

Semester Index. An average determined by weighting each grade received during a semester by the number of credit hours in the course.

Graduation Index. A weighted average of all the student's grades in all courses accepted by the school in which the student is enrolled.

Substitution of grades. With the advisor's consent, a student may repeat a course and substitute the most recent grade, unless it is an I.

In calculating these indexes, each grade is weighted:

A—6 x semester hours = index points
B—5 x semester hours = index points
C—4 x semester hours = index points
D—3 x semester hours = index points
E, F, WF, IF— 2 x semester hours = index points
U, IU, S, SI, I PI, W, WN, IN, P, N, WU ARE NOT INCLUDED

Minimum Graduation Index. Bachelor's Degree: 4.0. Associate Degree: 3.9.

Special scholarship indexes apply to students in the University Division.

Scholastic Probation

Associate or bachelor's degree candidates are placed on probation if the semester or graduation index at the end of any fall or spring semester is less than that required for the student with semester classifications shown below.

Index Levels for Probation

Classification	Semester Index Less Than	Graduation Index Less Than
1	3.5	3.5
2	3.5	3.6
3	3.6	3.7
4	3.6	3.8
5	3.7	3.9
6	3.7	4.0
7	3.7	4.0
8 and up	3.7	4.0

A student can be removed from probation at the end of the first semester following probation in which the semester and graduation indexes are equal to or greater than those required for the student with classifications shown above.

Probation applies only to regular semesters, not to summer sessions and intensive courses.

Any change of grade due to a reporting error will result in a recalculation of the indexes and a new determination of probationary status.

Scholastic Deficiency

A student on scholastic probation will be dropped from the University if, at the close of the fall or spring semester,

- the student receives grades of F or WF in six credit hours or more during the semester or
- the graduation index is less than that required of the student with classifications shown below.

Index Levels for Dropping

Classification	Graduation Index Less Than
1	3.3
2	3.4
3	3.5
4	3.6
5	3.7
6	3.8
7	3.9
8 and up	4.0

The scholastic deficiency rule does not apply in the semester that a student completes requirements for a degree.

A student dropped by this rule will be readmitted on probation.

Readmission Procedure

For Students Who are Academically Dropped for Scholastic Deficiency

Students who are academically dropped from the University may not register or attend classes in any capacity, either for credit or on an audit basis, unless they are readmitted by the Committee on Scholastic Deficiencies and Readmission. Students who are academically dropped are eligible for readmission only after they have completed at least one full, regular semester, fall or spring, of non-attendance. The summer session does not count.

Students who have been academically dropped more than once are required complete at least one calendar year of non-attendance.

Readmission Fee. Students carrying nine or more credit hours during the semester they are placed on drop status must pay a $50 readmission fee.

Applications and procedures for readmission are available in the Office of the Vice Chancellor for Student Services and Dean of Students, Lawshe Hall room 352. Phone: 989-2367.

Graduation Requirements

For the Bachelor's Degree

1. Completion of the plan of study for the degree, either by resident course work, examination, or credit accepted from another institution.

Ten year rule. The dean of school which administers the student's major can refuse to accept for graduation credit any course completed ten or more years ago. Re-entering students will be notified immediately of all such decisions.

Substitution of courses. The dean of the school which administers the student's major may authorize substitutions for courses for graduation.

2. **Residency Rule**. At least two semesters of enrollment in and completion of at least 32 credit hours approved and required for the degree, at the 300 level or above at Purdue University Calumet. Students are normally expected to complete the senior year in residence. Courses completed by examination will not apply to this rule.

Exception. With the prior approval of the dean of the school which administers the student's major, a student who has at least four semesters of resident study may complete not more than twenty semester hours of the senior year at another approved college or university.

For the purpose of this rule, two summer sessions are considered equivalent to one semester.

3. **Graduation Index of 4.00**.

Exception. A student who has completed all other requirements for the degree but does not have the minimum graduation index may meet the requirement by:

a. Securing the approval of the dean of the school administering the major, after review of the academic record, permission to register for additional courses. Such a student will not be allowed to take more than 20 credit hours beyond those required for the degree. OR

b. Securing in advance the approval of the dean of the school administering the major to register at another approved college or university for not more than nine of the 20 hours.

Copies of approvals must be filed in the Office of the Registrar. Credit in these additional courses must be earned no later than five years after the date on which all degree requirements were met, except the graduation index requirement.

The Graduation Index requirement will be met for such a student if the graduation index, now including the extra courses, meets the graduation index requirement in effect at the time when the student met all the other graduation requirements.

4. Registration as a candidate for the degree during the semester or summer session immediately preceding the completion of the degree.

5. **Proficiency in English.** For students admitted after summer 1979: Proficiency in the English language, demonstrated by passing the English Proficiency Examination or the English Exit Examination in ENGL 104.

There are no exceptions to this rule. Any instructor can advise students deficient in composition skills to attend the Writing Tutorial Laboratory where the students may work to improve their writing.

For the Associate Degree

1. Completion of the plan of study for the degree, either by resident course work, examination, or credit accepted from another institution.

Ten year rule. The dean of school which administers the student's major can refuse to accept for graduation credit any course completed ten or more years ago. Re-entering students will be notified immediately of all such decisions.

Substitution of courses. The dean of the school which administers the student's major may authorize substitutions for courses for graduation.

2. **Residency Rule**. At least two semesters of enrollment and completion of at least 32 credit hours at Purdue University Calumet. Students are normally expected to complete the entire second year in residence.

Exception. With the prior approval of the dean of the school which administers the student's major, the student who has at least three semesters of study in residence may complete no more than sixteen credits at another approved college or university.

For the purpose of this rule, two summer sessions are considered equivalent to one semester.

3. **Graduation Index of 3.90**

Exception. A student who has completed all other requirements for the degree but does not have the minimum graduation index may meet the requirement by securing the approval of the dean of the school administering the major to register for additional courses, after a review of the academic record. Such a student will not be allowed to take more than 10 credit hours beyond those required for the degree. Credit in these additional courses

must be earned no later than three years after the date on which all degree requirements were met, except the graduation index requirement.

The Graduation Index requirement will be met for such a student if the graduation index, now including the extra courses, meets the graduation index requirement in effect at the time when the student met all the other graduation requirements.

4. Registration as a candidate for the degree during the semester or summer session immediately preceding the completion of the degree.

5. **Proficiency in English.** For students admitted after summer 1979: Proficiency in the English language, demonstrated by passing the English Proficiency Examination or the English Exit Examination in ENGL 104.

There are no exceptions to this rule. Any instructor can advise students deficient in composition skills to attend the Writing Tutorial Laboratory where students may work to improve their writing.

Academic Honors

Dean's List

The Dean's List is Purdue University Calumet's way of recognizing undergraduate students for outstanding scholastic achievement. Each semester, the dean's list honors undergraduate students who

- have completed at least twelve credit hours for the graduation index
- complete at least six credit hours with a current semester index of 5.0 or greater
- have a graduation index of 5.5 or greater.

Semester Honors

Semester Honors recognize undergraduate students who

- have completed at least six credit hours in the semester index
- have a semester index of 5.5 or greater
- have a graduation index of 4.0 or greater.

Graduation with Distinction

Degrees with distinction are awarded to undergraduates who fulfill all the following requirements:

1. Complete a bachelor's degree with a minimum of sixty-five credit hours earned at Purdue Calumet, all of which must be eligible for inclusion in a graduation index of 5.3 or above, OR
   Complete an associate degree with a minimum of thirty-five credit hours earned at Purdue Calumet, all of which must be eligible for inclusion in a graduation index of 5.3 or above.
2. Of such eligible students, the graduates with graduation indexes in the highest ten percent of the graduation indexes of all the graduates in the School of Liberal Arts and Sciences and the School of Professional Studies for the spring semester. The minimum graduation indexes determined by each school in the spring apply for graduation with distinction in the subsequent summer session and fall semester.
3. **Graduation with Highest Distinction**. Awarded to those bachelor's degree candidates with graduation indexes in the top three per cent of the class. The minimum graduation indexes determined by each school apply for graduation with highest distinction apply in the subsequent summer session and fall semester.

Graduate Study

Office of the Assistant Vice Chancellor for Academic Affairs
Lawshe Hall Room 145
989-2257

Ten academic departments offer master's degrees and other programs of graduate study at Purdue University Calumet to meet the post-baccalaureate educational needs of the citizens of northwest Indiana and the surrounding areas.

The programs are flexible to suit the needs both of the graduate students and of business, industry, and human services agencies in Northwest Indiana.

They provide professional development for currently employed professionals through focussed courses as well as through degrees for a wide variety of student ages, schedules, and career paths, including those leading to doctoral study.

Programs:

- Master of Arts (in Communication)
- Master of Arts (in English)
- Master of Arts (in History)
- Master of Arts (in Teaching Economics)
- Master of Science (in Biology)
- Master of Science (in Biology Teaching)
- Master of Science (in Child Development and Family Studies: Research Option in Marriage and Family Therapy)
- Master of Science in Engineering
- Master of Science (in Management)
- Master of Science (in the Application of Mathematics)
- Master of Science (in Mathematics Teaching Option)
- Master of Science (in Nursing)
- Master of Science in Education (Elementary Education)
- Master of Science in Education, Secondary Education—areas in biology, chemistry, communication, educational media, English, foreign languages, history, mathematics, physics, political science, and sociology
- Master of Science in Education (Counseling and Personnel Services)
- Master of Science in Education (Instructional Design)
- Master of Science in Education (Administration elementary or secondary school)
- Master of Science in Education (Educational Media School Library and Audio-visual service)
- Also available on graduate level in Education: additional certifications in audio-visual, computer, English, foreign language, learning disabilities, library sciences, mathematics, reading, science, social studies, speech communications, and visual arts.

Students interested in graduate study should refer to the individual department listings of degree requirements elsewhere in this catalog. Correspondence about admission to the graduate school and inquiries about a specific department's requirements should be addressed to the head of the department to which the applicant seeks admission or to the graduate school office.

Admission to the Graduate School

Degree-Seeking Applicants

Applicants for specific graduate degrees may apply for graduate study through the Graduate School Office at Purdue Calumet, preferably four months before but no later than two weeks prior to the semester of desired admission.

Such applications are first evaluated by a departmental committee at Purdue Calumet. If recommended for admission, the application is submitted for a recommendation by the Assistant Vice Chancellor for Academic Affairs. The Purdue Calumet Graduate Office submits the application to Purdue University West Lafayette, where, depending on the department to which the applicant seeks admission, the application is forwarded to the West Lafayette academic department or directly to the Graduate School. When applications are approved by the Graduate School at West Lafayette, the student and the Purdue Calumet Graduate Office receive a letter indicating the semester of admission and any attached admission conditions.

General Admission Requirements:

1. A bachelor's degree from an accredited college or university
2. Graduation index of 5 ("B") on a 6-point scale (individual departments may set higher indexes)
3. Other requirements, as detailed by individual departments
4. Academic ability for graduate work.

Applicants must submit:

1. A completed application form
2. Three letters of recommendation
3. Two complete official transcripts of all previous college and university course work
4. A $25.00 application fee submitted to the Bursar at Purdue University West Lafayette
5. Other documents as required by the individual department
6. Other evidence of academic performance as required by the individual department
7. Graduate Record Examination. Required only of those
   - who hold a bachelor's degree from a non-accredited institution
   - who feel their previous academic record does not reflect their ability
   - those being considered for a fellowship or traineeship appointment
   - those applying for admission for a department which requires the GRE—consult specific department admission requirements.

Graduate Record Examination. Currently the GRE is given at Purdue Calumet during the fall and spring semesters. The Graduate Office has more information.

When to apply. Applications, transcripts, and supporting materials should be submitted to the department at least four months before the beginning of the session for which the applicant seeks admission. An applicant is not officially admitted until notification is received from the Dean of the Graduate School at West Lafayette. If the GRE is required, it should be taken during the first semester of the senior year.

Non-Degree Graduate Status

Students who wish to pursue study beyond the bachelor's degree but may not have specific degree objects may take graduate courses by submitting:

1. A completed application form
2. Two copies of the bachelor's degree diploma or two unofficial transcripts showing the completion of the bachelor's degree or two copies of the applicant's teaching certificate

Such students are not normally considered for graduate assistantships.

Students who apply for this status may later be considered for admission as degree-seeking graduate students.

Twelve Credit Rule. No more than twelve hours of credit earned as a non-degree-seeking student may be applied to a graduate degree if a student is later admitted as a regular degree-seeking graduate student. If an applicant for a regular degree program is approved during the semester in which the student is enrolled for the twelfth credit hour as a non-degree student, all credits completed prior to and during that semester are eligible for inclusion in the plan of study, providing the courses are appropriate for the degree and acceptable to the department and the Graduate School. Students who fail to gain admission as degree-seeking students in a timely fashion may lose credit already earned.

Grades Earned While on Non-Degree Graduate Status. No course in which a student receives less than a "B" may be included in a plan of study if the student completed the course while in non-degree status.

Teaching License Registrants

Bachelor's degree holders seeking graduate credit without a degree objective, such as graduate students working in teacher license programs or seeking to enhance professional qualifications in their occupation, may be admitted on a non-degree Graduate status.

Academic Regulations

Grades. Success in graduate study requires performance of a high quality. Only grades of A, B, or C fulfill Graduate School requirements. An advisory committee or a department may require grades higher than C in certain courses. Pass-fail grades are not acceptable.

Progress toward degree. Each student's progress is reviewed each semester by the student's department. If the student fails to perform satisfactorily by the judgement of the advisory committee, the department may ask the student to discontinue graduate study at Purdue Calumet.

Scholastic requirements during the fall and spring semesters apply to graduate study in the summer. The same grade standards apply to prerequisite courses.

English Requirement

All degree-seeking graduate students must demonstrate proficiency in English composition before filing a plan of study.

Candidates whose native language is English can meet the requirement by:

1. Earning grades no lower than "B" in graded undergraduate courses in composition prior to graduate admission, or
2. Earning scaled scores 600 or higher on the verbal Aptitude Section of the GRE or 36 or higher on the verbal portion of the GMAT,
3. All other students: Submitting test papers for the Writing Review Committee, which may hold a student's writing for further review if the test papers are not acceptable. Students whose work is held are expected to work toward satisfying the English Requirement without delay.

Students who must submit test papers will receive a letter from the Graduate Office at Purdue University Calumet with instructions and requirements for submitting test papers. After test results are received, the Graduate Office at Purdue Calumet informs the student and the advisor of the results.

Candidates whose native language is not English:

1. A minimal TOEFL score of 550. Since TOEFL is a measure of general English proficiency and not an indicator of written skills, the Graduate School at West Lafayette further recommends for non-native speakers
2. TWE exam scores. A score of five or higher is evidence of acceptable proficiency in writing. Students scoring lower than five on TWE are referred to the Office of Writing Review for further evaluation of proficiency in written English.

Requests for exceptions to these policies should be addressed to the Dean of the Graduate School at West Lafayette.

Foreign Language Requirement. There is no general foreign language requirement, though some departments do require a reading knowledge of a foreign language as a relevant research tool.

Registration

Students are urged to register during the advanced registration period to guarantee their choice of courses.

Registration for Research Credit. Graduate students who are using University facilities or are being supervised by a faculty member must register. Registration for research hours should reflect the nature and amount of the student's study and research activities accurately. Research includes literature reviews and thesis writing.

Registration in last semester. A candidate for any advanced degree must be registered during the last semester or session before receiving the degree. Students in the last semester of a thesis option master's program must be registered for a minimum of three hours of research unless specifically excused by the Graduate School to register for the degree only. Advice on registration is available through the individual department's graduate advisor.

Undergraduate And Transfer Credit

Undergraduate credit hours earned in excess of the requirements for the bachelor's degree, as well as graduate credits earned at other universities may be applied toward a graduate degree. The various departments determine the conditions under which transfer credit is awarded. The credit must be certified as excess by the dean of the school in which the student is enrolled. It will be accepted only

- if the course was designated for graduates
- if the course was taken during the student's senior year
- if the student earned a grade of A or B
- if the student had a final graduation index of 5 ("B") or better.

Transfer credits are allowed for the master's degree only after one semester of satisfactory work in residence at Purdue University.

Credit by exam. It is possible for graduate students to obtain credit by taking a comprehensive examination of a subject matter included in a specific course in special cases and only if authorized by the department. Such students must register for course examinations and pay a special fee.

Advisory Committees

Each candidate for the master's degree will have an appointed graduate committee consisting of three faculty members. This committee assists the student in preparing the plan of study and advises the student during graduate work. In the case of the thesis option, the committee also advises the student about research and writing the thesis.

With the approval of the head of the department, the student will select a major professor, who must agree to the appointment. The major professor chairs the advisory committee and oversees the student's research. The major professor and student must agree upon the related areas in the plan of study.

Plan of Study

The plan of study includes specific courses the student is expected to complete and all other requirements for the master's degree, as determined by the department. The plan of study is designed to meet the needs of the student, as determined by the advisory committee, and is approved by the Dean of the Graduate School at West Lafayette.

A tentative plan of study for each graduate student should be filed in advance of registration for the first semester of graduate work, with the formal plan of study submitted to the Dean of the Graduate School at West Lafayette before the final semester.

If it becomes necessary to revise the plan of study, a "Request for Change to the Plan of Study" must be submitted with a justification.

Admission to Candidacy

Admission to candidacy for the master's degree is granted only after approval of the formal plan of study. A candidate for any advanced degree must be registered during the semester in which the degree is awarded.

Oral and Written Examinations

The requirements for oral and written examinations are established by the advisory committee or the department. A final examining committee for each candidate certifies to the Graduate School that the student has met the requirements of the major department.

Student Services and Activities

At Purdue University Calumet, students find themselves challenged as never before, but they are not expected to go it alone. The campus offers a variety of programs and activities to help students toward reaching their intellectual, social and personal potentials.

Academic Advising

The School of Liberal Arts and Sciences, the School of Professional Studies, and the University Division offer academic advising on various programs of study, as do the individual academic departments on campus. Students consult their academic advisors for information on program requirements and career options in their majors. Every student has an academic advisor and is expected to meet with the advisor at least once a semester.

Information Center

Student/Faculty Library Center Room 120 989-2400

The Information Center is a starting point to get other information about the university and the campus. Knowledgeable people will direct students to other points and persons who have the information they need.

The Counseling Center

Student/Faculty Library Center Room 341 989-2366

The Center provides a variety of counseling services to individuals, couples, groups, and families. The focus on developmental counseling helps students to deal with personal, social and academic concerns, as well as career development and other plans for life.

Counselors help students deal with special issues such as marital and family problems, stress, decision-making, conflict resolution, drug and alcohol abuse, and other personal concerns.

Development seminars help students enhance self-awareness and academic success. The seminars focus on such issues as time management, study skills, test anxiety, stress, assertiveness, drug and alcohol abuse prevention, and human sexuality.

Testing services and educational counseling are available to students who are undecided about college majors, who have not chosen career goals, or who have academic problems.

Library

Student/Faculty Library Center Second Floor 989-2224

The Library is open 75 hours a week, including Saturday, Sunday, and evening hours to accommodate the information needs of busy students and faculty. With seating for nearly 500 students and individual carrels for private study, the Library is a quiet place on campus for students to devote themselves to their studies.

The Library has over 220,000 physical volumes, nearly half a million microfilm holdings, and 1700 current periodicals. Purdue Calumet's Library is supplemented by interlibrary loan service for students and faculty. As a member of the Online Computer Library Center, Purdue Calumet's library users have high speed electronic access to the 23 million titles held by ten thousand member libraries.

Computer Education Building and Computing Facilities

Not only do students at Purdue Calumet learn with computers, they also learn about computers. Purdue University Calumet has state-of-the-art computer facilities and is especially rich in its computer hardware. Besides the computer labs in various departments and computer terminals in the library, the Computer Education Building provides students with access to one of the best small university computer environments in the country.

Ten separate campus computer labs are open to students nearly 16 hours per day, including weekends. Students may use the 24-hour, off-campus dial-up phone service to access a cluster of super minicomputers. Campus equipment includes:

- three VAX supermini computers with 144 ports
- IBM 4341 mainframe with 8 million characters of main storage and 3.5 billion characters of disk storage
- nearly 200 microcomputers in various labs
- several local area networks (LAN) connecting campus computers
- a desktop publishing lab.

Office of Career Development and Placement

Student/Faculty Library Center Room 350 989-2419

This office serves Purdue Calumet students and alumni with career planning information and help in searching for jobs. The staff assists in finding part-time, full-time, co-op, volunteer, or internship positions.

PCSLOTS is a computerized job listing service maintained through this office. Employers contact the office daily to post job openings. Students can then look at the listings either in the office or from another computer on the university network. The office also publishes a monthly newsletter, SLOTS, summarizing current job listings. Employers also come to campus to interview and screen prospective graduates and alumni.

Career Resource Center. As a part of the Office of Career Development and Placement, the Resource Center provides information for career planners and job seekers. The center has directories of occupations and employers, information on graduate schools, statistics on graduates' employment, career and job search newsletters, and free career materials. The Center is a Federal Job Information Center, distributing federal listings and testing information.

Cooperative Education. Part of the responsibility of the Career Development and Placement Office is Cooperative Education, a learning and training experience for qualified students majoring in Engineering, Construction Technology, Information Systems and Computer Programming, Mechanical Engineering Technology, Industrial Engineering Technology, Supervision, Manufacturing and Engineering Technology, and Electrical Engineering Technology. Additional co-op experiences are available in Behavioral Science, Biology, Chemistry, English and Philosophy, Communication and Creative Arts, and Mathematics and Computer Science.

Qualified students work alternating work sessions and study semesters for three or four years, with progressively more responsibility as their work sessions progress. Students gain hands-on experience in paid positions at one of the participating companies.

Student Activities

Student/Faculty Library Center Room 325 989-2369

For commuting students, Purdue Calumet offers a variety of activities for those who like to be involved in social activities, departmental clubs, and other organizations. The *Chronicle*, the student newspaper, Homecoming Week, special performances, dances, and a variety of other special events are all part of student life on campus.

Collegiate affiliates of professional societies support academic and career objectives. Special interest clubs, including fraternities, sororities, and ethnic, musical, religious, and theater organizations, encourage fellowship, leadership, and service to the community and the campus.

More than 40 clubs have been organized around special interest areas. For the 1990-91 school year, Purdue Calumet sponsored the following clubs:

Alpha Chi Honor Society
Amateur Radio Club
American Institute of Industrial Engineers
Astronomy Club
Bible Study Union
Biology Club
Black Student Union
Cheerleaders
Chess Club
Club MET (Society of Manufacturing Engineers)
Committee Against Racism
Delta Psi Omega Sorority
Electrical Engineering Technology (EET)
Gamma Delta Iota Fraternity
International Club
InterVarsity Christian Fellowship
Los Latinos
Minority Assistance Club
National Association of Accountants
National Education Association
Nursing Class (Sophomore)
Nursing Class (Freshman)
Operation Avalanche
P.A.T.H. (Planet Awareness That Helps)
Phi Kappa Theta
Phi Sigma Kappa
Public Affairs Club
Public Relations Club
PUC College Republicans
PUC Construction Organization (PUCCO)
PUC Marketing Association
PUC Men's Volleyball Club
PUC Young Democrats Collegiate
Purdue Chronicle
Restaurant, Hotel & Institutional Management Club
Sigma Gamma Rho Sorority
Ski Club
Society for Human Resource Management
Society of Automotive Engineers (SAE)
Society of Hispanic Profess. Engineers (SHPE)
Student Government
Student Programming Board
Tau Alpha Pi National Honor Society
Theta Phi Alpha Sorority
Women to Women

The Student Government Association gives students the opportunity to share in the governing of campus activities and policies, and is the students' voice on faculty and other administrative committees.

Athletics, Intramurals and Recreation

Physical Education-Recreation Building Room 107 989-2540

The Physical Education-Recreation building is the base for a broad range of intramural athletics and open recreation for students, faculty, and staff. Intercollegiate athletics include women's teams in volleyball and basketball and men's teams in basketball and soccer, through the National Association of Intercollegiate Athletics. Club sports are also offered in men's golf and women's softball.

The Aerobic Super Circuit is the focal point of the Fitness Center in the Physical Education-Recreation Building. With state-of-the-art fitness machines for a complete workout, the Center is open to all members of the University community. Full-sized basketball courts, racquetball courts, a weight room, and an indoor running track, along with outdoor playing fields extend the building's capacity to serve athletes, beginners and experts alike.

Educational Opportunity Programs

Student/Faculty Library Center Room 339 989-2392

Upward Bound. Upward helps prepare students to bridge the gap between high school and college. A pre-college preparatory program, Upward Bound provides academic support, cultural enrichment, and personal and career counseling to increase the academic skills and motivational levels of participants.

Students are identified and selected for Upward Bound during their sophomore year in high school. The program includes two phases:

First Summer—students spend seven weeks on the Purdue West Lafayette campus enrolled in both academic and elective courses.

Second Summer—students attend an eight-week session on Purdue University Calumet campus enrolled in 6 hours of college credit courses and career-planning sessions. During the academic year, students are enrolled in academic enrichment courses and other activities each Saturday at Purdue Calumet.

Porter Hall Room 108
989-2460

Educational Talent Search. Educational Talent Search is a federally funded program for first generation and economically disadvantaged students, ages 12 to 27, who wish to pursue post-secondary, college education. The office serves students from junior and senior high schools as well as adult learners.

The office includes a library of admissions applications, catalogs and brochures of colleges and universities throughout the United States. The program provides individual advising and referrals to other agencies and organizations. Activities include admissions and financial aid workshops; Scholastic Aptitude Test (SAT) preparation and tutoring, especially in Math, Science, and English; and college and career exploration.

Student/Faculty Library Center Room 312
989-2779

Ronald E. McNair Post-Baccalaureate Achievement Program. The McNair Program is a federally funded program designed to prepare and encourage study in doctoral programs by students from groups underrepresented in graduate education. Participants can take advantage of a support system to enhance their academic and social experiences at Purdue Calumet through summer research internships, seminars to prepare for doctoral study, tutoring, counseling, graduate and professional school visits, and assistance with graduate admission and financial aid.

Student/Faculty Library Center Room 345
989-2455

Student Support Services. Student Support Services helps non-traditional Purdue University Calumet students to graduate. Disabled, low-income, or first-generation college students are welcome to take advantage of the services in order to help them become academically more successful. Services include: academic pre-advising, career counseling, individualized tutorial services, assistance to the handicapped.

Office of Veterans' Affairs

Gyte Building Room 71A
989-2210

Veterans enrolled on campus can receive assistance from university staff members in the office. Services include advising about benefits, career testing and counseling, personal counseling, and referrals to other agencies.

Office of the Vice Chancellor for Student Services and Dean of Students

Lawshe Hall Room 352
989-2367

When students come to the University, they find many administrative offices willing to help them and many rules they must follow. Some of those rules are recorded in the *Student Handbook* and elsewhere in this catalog. Knowing the rules and following them is part of the responsibility of being a student at Purdue University Calumet.

Sometimes, in spite of the University's efforts to help students with their personal and academic goals, some students continue to have concerns. Students who have exhausted all their other options can find help at the Office of the Vice Chancellor for Student Services and Dean of Students.

This office is responsible for interpreting campus rules, practices, policies, and regulations affecting the quality of student life. Readmissions, disciplinary concerns, housing lists, emergency loans, and other university services are coordinated by the office.

Child Care Center

Porter Hall Room 107 & 109
989-2501/2763

Operating as a teaching lab through the Department of Behavioral Sciences, the Child Care Center offers children of students, faculty, and staff of Purdue Calumet quality care while parents carry on university business. The Center is open all year excluding University holidays. Children who are at least three years old and toilet trained through kindergarten age can stay for blocks of time or all day at a reasonable cost.

The Child Care Center also offers an afternoon and evening care service for children whose ages are three to twelve years. To guarantee space, the Center encourages regular enrollment. Drop-in care is offered on a first-come, first-served basis for an hourly fee.

University Police

Central Heating and Cooling Building
989-2911

The University Police Department handles calls from telephone hotlines throughout the campus for problems of safety and security, and issues parking permits for students and faculty. The department also issues parking violation notices and collects fines for illegal parking. Motorists in trouble may call the police department for connections to motorist aid.

Skills Assessment and Development Center

Gyte Building
Room 106
989-2504

This Center provides testing for placement in Mathematics, English, and Foreign language courses, as well as such standardized tests as SAT, ACT, GMAT, GRE, CLEP, and the California Achievement Test.

Tutoring is also available to students and to the community through drop-in sessions scheduled throughout the semester. The Information Center on campus can give students a copy of the tutoring schedule for each semester.

The Institute for Continuing Education

Physical Education-Recreation Building
Room 120
989-2228

The Institute for Continuing Education offers many non-traditional credit and non-credit courses, drawing on the full resources of the university, working closely with the faculty and participating community groups to design new programs and services to meet the needs of the community.

Conferences, seminars, institutes, teleconferences, field trips, and short courses for enrichment and professional advancement are coordinated by the Institute. The Continuing Education staff works with community groups to schedule, sponsor, and assist in evaluating conferences that suit the needs of the group. Regular announcements of programs are mailed to every home in northwest Indiana and are available at the Information Center.

Department of Behavioral Sciences

Rose E. Ray, Head

Faculty:

F. Ali
G. M. Casanova
A. A. Coolidge (Emeritus)
R. L. Cherry
V. B. Damusis
B. J. Davis
G. A. Farley
M. J. Flannery
J. L. Hack
W. Hartmann (Emeritus)
J. B. Hill
E. V. James
D. R. Kirkpatrick
L. S. Mura
D. M. Niedner
D. L. Pick
K. A. Pierce
J. M. Pluckebaum
J. E. Prebis
D. Raden
T. D. Sherrard (Emeritus)
A. J. Spector
T. S. Trepper
M. P. Vajagich (Emeritus)
D. L. Vorwald
M. B. West
J. L. Wetchler

The Department of Behavioral Sciences offers students a broad-based liberal education, enabling them to function effectively in a world of rapid change, in careers in such fields as government, business, mental health, hospitality, health care, child care, or social services. The department provides students with skills and strategies to understand individual and group behavior, to learn how to relate well to others, and to understand the relationships between social problems and the social environment.

As one of the most diverse academic units on campus, the department offers courses in a variety of disciplines concerned with human behavior: anthropology, child care, consumer and family sciences, dietetic technology, restaurant, hotel, and institutional management, psychology, sociology, criminal justice, gerontology, and social work, from the associate to the master's level, including transfer programs.

Internships are offered in the graduate program in marriage and family therapy with an off-campus human services agency; a two-semester practicum experience is required in both the early childhood development and social work programs. A one-semester field experience is required in psychology, restaurant, hotel, and institutional management, and criminal justice, two semesters in gerontology and four semesters in dietetic technology. Such experiences provide practical experience under supervision and allow first-hand experience and observation of various institutions' responses to humans and their needs.

The campus child care center serves as a laboratory for the early childhood development program. The psychology laboratory is a computer-assisted student laboratory which allows students to engage in simulated experiments and analysis of data from classroom experimental projects.

Programs

Associate of Arts, Early Childhood Development

Associate in Applied Science, Dietetic Technology

Associate in Applied Science, Food Service and Lodging Supervision

Bachelor of Arts, Psychology, options in General Psychology, Clinical Psychology, Developmental Psychology, Industrial Psychology, and Research

Psychology Minor

Bachelor of Science, Restaurant, Hotel, and Institutional Management

Bachelor of Arts, Sociology, options in General Sociology, Criminal Justice, Gerontology, and Social Work

Sociology Minor

Master of Science in Child Development and Family Studies: Research Option in Marriage and Family Therapy

Associate of Arts, Early Childhood Development (60 credits)

1. Communications

ENGL 104 English Comp. I OR ENGL 103 Adv. Freshman Comp.

COM 114 Fund. Speech Comm.

2. Science and Mathematics

Math/Science: 6 credits of lab science, Math, or Computer Science required.
One of:

BIOL 211 Soc. Impact Biol. Sciences
BIOL 101 Intro. Biology
BIOL 203 Human Anatomy

Recommended Science/Math courses:

BIOL 212 Social Impact Biol. Sci.
BIOL 102 Intro. Biology
BIOL 204 Human Anatomy
any Math, CIS, or CS courses

3. Social Sciences

PSY 120 Elementary Psychology
PSY 361 Human Development I
PSY 362 Human Dev. II
PSY 344 Human Sexuality
SOC 100 Intro. Sociology
SOC 350 Social Psych. Marriage Family

4. Early Childhood Development

BHS 112 Intro. Early Childhood Ed.
BHS 113 Appl. Devel. Childcare
BHS 200 Techniques Human Assess
BHS 212 Early Childhood Curriculum
BHS 213 Early Childhood Curric. II
BHS 222 Practicum Early Childhood I
BHS 223 Practicum Early Childhood II
BHS 251 Childcare Administration

5. Other Requirements

One elective and F&N 260 Nutrition

Associate in Applied Science, Dietetic Technology (70 credits)

1. Communication

ENGL 103 Adv. Freshman Comp. OR ENGL 104/105 English Comp. I/II

ENGL 420 Business Writing
COM 114 Fund. Speech Comm.

2. Science and Mathematics

MA 113 Intermediate Algebra
CIS 100 Computer Utilization

3. Behavioral Sciences

PSY 120 Elementary Psychology
SOC 100 Introductory Sociology

4. RHI Dietetic Technology Option

F&N 203 Foods: Selection & Prep.
F&N 303 Essentials of Nutrition
F&N 330 Diet. Selection & Planning
F&N 360 Nutrition for the Aging
MGMT 200 Intro. Accounting
RHI 100 Intro. Food Service & Lodging
RHI 191 Food Service Sanitation
RHI 212 RHI Organ. & Mgmt.
RHI 261 Dietetic Tech. Field Exp.
RHI 291 Quantity Food Production
RHI 311Y Purchasing for RHI
RHI 312Y Personnel Mgmt. for RHI
RHI 341 Cost Controls in Food Serv.
RHI 492 Adv. Food Service Mgmt.
One RHI or F&N elective

Associate in Applied Science, Food Service & Lodging (69 credits)

1. Communication

ENGL 103 Adv. Freshman Comp. OR ENGL 104/105 English Comp. I/II

ENGL 420 Business Writing
COM 114 Fund. Speech Comm.

2. Science and Mathematics

MA 113 Intermediate Algebra
CIS 100 Computer Utilization

3. Behavioral Sciences

PSY 120 Elementary Psychology
SOC 100 Introductory Sociology

4. RHI Food Service and Lodging Option

F&N 203 Foods: Selection and Prep.
F&N 303 Essentials of Nutrition
RHI 100 Intro. Food Service
RHI 181 Lodging Management
RHI 191 Food Service Sanitation
RHI 212 RHI Organ. and Mgmt.
RHI 291 Quantity Food Production
MGMT 200 Intro. Accounting
RHI 301 Practicum in RHI
RHI 311Y Purchasing for RHI
RHI 312Y Personnel Mgmt. for RHI
RHI 321 Equipment for RHI
RHI 341 Cost Controls in Food Ser.
RHI 411 Hospitality Law
RHI 492 Adv. Food Service Mgmt.
One RHI or SPV elective

Bachelor of Arts, Psychology (126 credits)

Requirements for all Psychology Degrees:

1. Communication

ENGL 103 Adv. Freshman Comp OR ENGL 104/105 English Comp. I/II

COM 114 Fund. Speech Comm.
Foreign Language 101–102–201–202

2. Science and Mathematics

Twelve credits in science and mathematics with a minimum of three credits in each. No sequence required. Computer Science or Logic acceptable for mathematics.

3. Humanities and Social Sciences

One course each from:

Literature
Philosophy (not Logic)
History
Aesthetics
Economics 210
Political Science
Psychology 120
Sociology 100 or Anthropology

4. Psychology and Behavioral Sciences

BHS 201 Statistical Methods
PSY 203 Intro. Research Methods
PSY 205 Testing and Measurement
PSY 430 Sys. Theories of Psych.

One of:

PSY 311 Human Learning Memory
PSY 314 Introduction to Learning

One of:

PSY 310 Sensation & Percept. Proc. PSY 322 Brain and Behavior

5. Electives or minor (33-36 credits)

Bachelor of Arts, Psychology, General Option (126 credits)

Requirements for Psychology degree plus:

Any six Psychology courses at 300 level or above (18 credits).

Bachelor of Arts, Psychology, Clinical Option (126 credits)

Requirements for Psychology degree plus:

PSY 350	Abnormal Psychology	PSY 480	Field Exper. in Psychology
PSY 420	Intro. Personality Theory	PSY 523	Intro. Theories Pscho-Therp.

And two psychology courses at 300 level or above. Recommended:

PSY 344	Human Sexuality	PSY 428	Drugs and Behavior
PSY 349	Psychology of Women	PSY 443	Aggression and Violence
PSY 361	Human Develop. I	PSY 532	Psy. Disorders of Childhood
PSY 362	Human Develop. II	PSY 535	Psy. of Death and Dying
PSY 363	Human Develop. III	PSY 550	Intro. Clinical Psy.

Bachelor of Arts, Developmental Psychology Option (126 credits)

Requirements for Psychology degree plus:

Four courses from:

PSY 361	Human Develop. I	PSY 433	Issues in Develop. Psy.
PSY 362	Human Develop. II	PSY 480	Field Exp. in Psy
PSY 363	Human Develop. III		

Two psychology courses at the 300 level or above. Recommended:

PSY 344	Human Sexuality	PSY 428	Drugs and Behavior
PSY 349	Psychology of Women	PSY 443	Aggression & Violence
PSY 350	Abnormal Psychology	PSY 532	Psy. Disorders of Childhood
PSY 420	Intro. Personality Theory	PSY 535	Psy. of Death & Dying

Bachelor of Arts, Industrial Psychology Option (126 credits)

Requirements for Psychology degree plus:

Four courses from:

SOC 340	General Social Psychology	PSY 374	Organ & Behavior
PSY 373	Psy. Work Behavior	PSY 480	Field Experience in Psychology
PSY 386	Psy. of Consumer Behavior		

Two courses from:

ANTH 341	Culture & Personality	OBHR 430	Labor Relations
SOC 314	Race & Ethnic Relations	OBHR 431	Personnel Relations
SOC 315	Computers in Sociology	SPV 375	Basic Methods of Train.
SOC 416	Industrial Sociology	SPV 376	Supervision & Persnl. Prblms.

PSY elective at 300-500 level

Bachelor of Arts, Psychology, Research Option (126 credits)

Requirements for Psychology degree plus:

A. PSY 498 Senior Research in Psychology (6 credits)

B. Any four Psychology courses at 300-500 level.

Psychology Minor (18 credits)

PSY 120	Elem. Psychology	PSY 203	Intro. Research Methods
BHS 201	Statistical Methods	*9 credits of Psychology at 300-500 level*	

Bachelor of Science, Restaurant, Hotel, and Institutional Management (129 credits)

1. Communications

ENGL 103 Adv. Freshman Comp OR ENGL 104/105 English Comp. I/II

COM 114 Fund. Speech Comm.
ENGL 420 Business Writing

2. Behavioral Sciences, Economics, and Mathematics

ECON 210 Economics (or higher)
PSY 120 Elementary Psychology
SOC 100 Intro. Sociology
SOC 350 Social Psychology of Marriage
MA 113 Algebra
CIS 100 Computer Utilization OR
CIS 204 Intro. Computer Systems

3. General Education electives

One from: COM, ENGL(literature only), HIST/POL, STAT
Two from: Math or Science
Two from: A&D, ENGL, HIST, MUS, PHIL, FLL, THTR

4. RHI Core requirements

F&N 203 Foods Select. & Prep.
F&N 303 Essent. Nutrition
RHI 100 Intro. Food Service and Lodg.
RHI 181 Lodging Mgmt.
RHI 191 Food Service Sanitation
RHI 212 Organization and Mgmt.
RHI 231Y Marketing
MGMT 200 Intro. Accounting
RHI 251 Computers Hosp.
RHI 291 Quantity Food
RHI 301 Practicum in RHI
RHI 312Y Personnel
RHI 341 Cost Control
RHI 411 Hospitality Law
RHI 441Y Finance
RHI 499Y Operations Analysis

5. RHI emphasis area, selected in junior year from one of the following:

Hospitality Management

RHI 311Y Purchasing
RHI 492 Advance Food Mgmt.
RHI elective
SPV elective
MGMT elective

Hotel Management

RHI 322 Property Maint.
RHI 331 Meetings Conv. Sales
RHI 371 Intro. Tourism
RHI 381 Executive Hsekpg.
RHI 492 Adv. Food Mgmt.

Restaurant Management

RHI 311Y Purchasing
RHI 321 Equipment for RHI
One of:
RHI 323 Layout/ Design
RHI 491 Beverages and Their Mgmt.
RHI 492 Adv. Food Service Mgmt.
RHI 322 RHI Property Mgmt.

Tourism

COM 253 Intro. Public Rel.
COM 355 Fund. Advertising
MGMT 324 Marketing Mgmt.
RHI 331 Meetings Con. Sales
RHI 371 Intro. Tourism

6. Electives (15-16 credits)

Bachelor of Arts, Sociology (126 credits)

Requirements for all Sociology Degrees:
1. Communications

ENGL 103 Adv. Freshman Comp OR ENGL 104/105 English Comp. I/II

COM 114 Fund. Speech Comm.
Foreign Language: 101-102-201-202

2. Science and Mathematics

Twelve credits in science and mathematics with a minimum of three credits in each. No sequence required. Computer Science or Logic acceptable for mathematics.

3. Humanities and Social Sciences

One course each from

Literature
Philosophy (not Logic)
History
Aesthetics
Economics 210
Political Science
Psychology 120
Sociology 100

Bachelor of Arts, General Sociology Option (126 credits)

Requirements for Sociology degree plus:

SOC 220 Social Problems
SOC 340 General Social Psych.
SOC 383 Intro. Methods Social Res. II
SOC 402 Principles of Sociology
BHS 201 Statistical Methods
ANTH any 3 credits
15 additional credits in Sociology at 300 level or above

Electives or minor (36-39 credits)

Bachelor of Arts, Criminal Justice Option (126 credits)

Requirements for Sociology degree plus:

SOC 220 Social Problems
SOC 422 Criminology
POL 346 Law and Society
POL/SOC 343 Intro. Criminal Just.
POL/SOC 443 Practicum Criminal Just.
SOC 383 Intro. Methods Social Res. II
SOC 402 Principles of Sociology

One of:
PSY 500 Statistical Methods
BHS 201 Statistical Methods

One of:

COM 250 Mass Communication
COM 310 Family Communication
PHIL 260 Philosophy & Law
HIST 325 Crime in America
HIST 336 Organized Crime
POL 354 Civil Liberties Const.
POL 460 Judicial Politics
POL 300 Intro. Political Analysis
PSY 428 Drugs and Behavior
PSY 443 Aggression and Violence

Two of:

SOC 314 Race & Ethnic Relations
SOC 340 General Social Psychology
SOC 411 Social Stratification
SOC 421 Juvenile Delinquency
SWRK 364 Child & Family Welfare

Bachelor of Arts, Gerontology Option (126 credits)

Requirements for Sociology degree plus:

BHS 201	Statistical Methods	SOC 430	Sociology of Aging
SOC 220	Social Problems	SOC 460	Field Exp. Geron.(6 cr.)
SOC 361	Field of Social Work	PSY 363	Human Develop. III .
SOC 383	Intro. Social Res.	PSY 535	Psych. Death Dying
SOC 402	Principles of Sociology		

Three from:

SOC 261	Intro. Social Work	PSY 344	Human Sexuality
SOC 411	Social Stratification	PSY 350	Abnormal Psychology
SOC 440	Soc. Health and Illness	PHIL 325	Ethics and Public Health
SOC 562	Public Social Services	COM 365	Communication and Aging

Bachelor of Arts, Option in Social Work (126 credits)

Requirements for Sociology degree plus:

BHS 201	Statistical Methods	SWRK 361	Field of Social Work
PSY 361	Human Develop. I	SWRK 364	Child/Family Welfare
PSY 362	Human Develop. II	SWRK 462	Field Practicum
SOC 220	Social Problems	SWRK 463	Field Practicum
SOC 383	Intro. Meth. Social Res.	SWRK 465	Social Work Techn.
SWRK 261	Intro. Social Work	SWRK 466	Human Ser. Skills

Sociology Minor (18)

SOC 100	Introductory Sociology	12 Sociology credits at 300 -500 level
SOC 220	Social Problems	

Master of Science in Child Development and Family Studies: Research Option in Marriage and Family Therapy (60 credits)

Special Admission Requirements:

1. A 1000-word autobiographical statement demonstrating that the student has adequate preparation

2. Combined verbal and math Graduate Record Examination score of 1000.

Degree Requirements:

1. Required courses:

CDFS 590	Family Therapy Skills	CDFS 669	Practicum Fam. Therapy (3 sem.)
CDFS 601	Advanced Child Devel.	CDFS 670	Human Sexuality
CDFS 602	Adv. Family Studies	CDFS 678	Field Experience (2 sem.)
CDFS 603	Theories Fam. Therapy	CDFS 680	Prof. Issues
CDFS 615	Research Methods	CDFS 698	Research M. S. Thesis (6 credits)
CDFS 663	Structural Fam. Therapies	CDFS	elective
CDFS 664	Behav. Comm. Fam. Therapies	PSY 500	Stat. Methods
CDFS 665	Trans. Fam. Therapies	PSY 673	Psy. Behavior Disorders

2. Five hundred hours of face to face contact with clients

3. Completed thesis and its oral defense

Department of Biology

Terence J. Dougherty, Head

Faculty:

A. M. Chelich
R. L. Peloquin
J. R. Shoup
W. T. E. Ting
C. C. Tseng
J. F. Wermuth
R. J. Werth
K. S. Wilson (Emeritus)

The Department of Biology offers a number of programs leading to the Bachelor of Science degree, a one- or two-year program in prepharmacy, and three two-year transfer programs in cooperation with the School of Agriculture at Purdue University West Lafayette. The department also provides courses for students planning to use Biology as a primary teaching area. In addition, the department offers a master's degree in biology for further professional development or as a bridge to further graduate study in the life sciences.

Areas of particular strength in the department are microbiology, as related to diseases and to food processing, cell and molecular biology with emphasis in biotechnology, ecology and conservation, and human and animal physiology.

The department's offerings are focused on career options, and are supplemented by up-to-date facilities in labs for studying cell and molecular biology/recombinant DNA, tissue culture, microbiology and environmental biology. Supervised research opportunities are available for qualified undergraduate students. The Biology Club serves as a way for biology majors and faculty to meet informally on campus.

Programs

Bachelor of Science, Biology, options in biotechnology, microbiology, zoology, botany, premedicine, predentistry, secondary science teaching

Bachelor of Science, Medical Technology

Transfer programs in agriculture, preforestry, preveterinary science and medicine, preoptometry, prepharmacy, prephysical therapy, and preoccupational therapy

Master of Science, Biology and Biology Teaching

Bachelor of Science, Biology (124 credits)

Requirements for all Biology Degrees:

1. Communications

ENGL 103 Adv. Freshman Comp.	OR	ENGL 104/105 English Comp. I/II

ENGL 104 English Comp. I (Grade of A) AND English Writing/Literature elective (Recommended: ENGL 220 Tech. Report Writing)

2. Science and Mathematics

Physical Science—Physics. Choose A or B

A.

PHYS 220/221 General Physics

B.

PHYS 152 Mechanics	PHYS 342 Modern Physics
PHYS 251 Heat, Electricity, & Optics	PHYS 343 Modern Physics Lab.

Physical Sciences—Chemistry. Choose A, B, or C

A. For most students:

CHM 111/112	General Chemistry	CHM 223	Intro. Qualit. Analysis
CHM 254	Organic Chem. Lab.	CHM 256	Organic Chemistry
CHM 255	Organic Chemistry	CHM 258	Organic Chemistry Lab.
CHM 333	Principles Biochemistry OR	CHM 224	Intro. Quant. Analysis

B. For students with strong high school chemistry background:

CHM 115/116	General Chemistry	CHM 256	Organic Chemistry
CHM 254	Organic Chemistry Lab.	CHM 258	Organic Chemistry Lab.
CHM 255	Organic Chemistry		
CHM 333	Principles Biochemistry OR	CHM 224	Intro. Quant. Analysis

C. For students with strong high school chemistry planning to specialize in quantitative areas of biology:

CHM 115/116	General Chemistry	CHM 220	General Chemistry
CHM 261/262	Organic Chemistry	CHM 263/264	Organic Chemistry Lab.
CHM 333	Principles Biochemistry OR	CHM 224	Intro. Quant. Analysis

Biology requirements listed under Bachelor of Science Options, next page.

Mathematics –Choose A or B

A. For most students:

MA 223/224	Intro. Analysis I	STAT 301	Elementary Statistical Methods

One of:

CIS 200	Computer Programming Fund.	CS 171	FORTRAN
CIS 204	Intro. Computer-Based Systems	CS 191	Pascal

B. For students with strong math background:

MA 163/164 Integrated Calc. & Geom. I/II

One of:

CIS 200	Computer Programming Fund.	CS 171	FORTRAN
CIS 204	Intro. Computer-Based Sys.	CS 191	Pascal
STAT 301	Elementary Statistical Methods		

Recommended for students in quantitative areas of biology:

MA 261	Multivariate Calculus	MA 262	Linear Algebra

3. Humanities and Social Sciences

At least 6 credits from two groups, including a two-course sequence.

A. literature, philosophy, creative arts
B. history, political science
C. economics, sociology, psychology

D. foreign language: all biology, premedical, and predental majors must demonstrate proficiency in a modern foreign language at the level of the second semester college course.

Bachelor of Science, Biology: Options in Microbiology, Zoology, Botany, Premedical, Predental (124 credits)

1. Biology Requirements

BIOL 101/102 Intro. Biology
BIOL 285 Environmental Biology
BIOL 320 Intro. Cell Biology
BIOL 321 Lab. Intro. Cell Biology
BIOL/AGRY 429 Genetics Lab.
BIOL/AGRY 430 Genetics

One of:

BIOL 207 Plant Morphology
BIOL 208 Vertebrate Histology
BIOL 220 Intro. Microbiology
BIOL 221 Intro. Microbiology

2. Biology Electives

General Biology, microbiology, zoology, botany, premedical, and predental majors: additional biology courses (9-10 cr.) at 300 level or above in individual specialization.

To qualify for National Registry of Microbiologists or meet U.S. Civil Service classification requirements: 33 credits in biology, 20 of which must be in microbiology. Consult advisor.

Bachelor of Science, Biology: Option in Biotechnology (124 credits)

1. Biology Requirements

BIOL 101/102 Intro. Biology
BIOL 221 Intro. Microbiology
BIOL 320 Intro. Cell Biology
BIOL 321 Lab. Intro. Cell Biology
BIOL/AGRY 429 Genetics Lab.
BIOL/AGRY 430 Genetics
BIOL 595E Special Assignment
BIOL 595 Modern Biotechnology or other research course

2. Biology Electives

Recommended:

BIOL 285 Environmental Biology
BIOL 507 Molecular Biology
BIOL 508 Recombinant DNA
BIOL 510 Microtechnique
BIOL 524 Microbiology
BIOL 561 Immunology
BIOL 595 Animal Tissue Culture
BIOL 595 Medical Genetics

Bachelor of Science Secondary Science Teaching (124 credits)

1. Communications

ENGL 103 Adv. Freshman Comp. (Grade of B or better) OR ENGL 104/105 English Comp. I/II

COM 114 Fundamentals of Speech OR COM 115 Fund. Public Speaking

State Teacher Certification requires 9 credits of oral and written expression. Take one of the following, if needed to complete 9 credits: COM 115 COM 314 ENGL 304 ENGL 405

2. Humanities

A. 6-9 credits from the following, with no more than 3 credits from each category:

Literature

ENGL 210 Gender & Style in Literature
ENGL 231 Intro. Literature
ENGL 232 Thematics Studies in Literature
ENGL 240 Survey of English Literature I
ENGL 241 Survey of English Literature II
ENGL 250 Great American Books
ENGL 260 Intro. World Literature I
ENGL 261 Intro. World Literature II
ENGL 320 By and About Women
ENGL 350 Survey American Literature I
ENGL 351 Survey American Literature II
ENGL 355 Afro-American Literature

Aesthetics:

A&D 255 Art Appreciation
MUS 250 Music Appreciation
PHIL 106 Human Exp. Art, Literature
THTR 201 Theater Appreciation

Philosophy:

PHIL 101 History of Philosophy
PHIL 110 Intro. Philosophy
PHIL 111 Ethics
PHIL 206 Philosophy of Religion

B. Foreign Language (0-12)

101-102-201-202

Note: total credits in combined communication & humanities must equal at least 18.

3. Mathematics:

For Biology as the primary teaching area:

MA 223/224 Intro. Analysis I/II OR MA 163/164 Integrated Calc. & Geom. I/II

For Chemistry as the primary teaching area:

MA 163/164 Integrated Calc. & Geom. I/II
MA 261 Multivariate Calculus

For Physics as the primary teaching area:

MA 163/164 Integrated Calc. & Geom. I/II
MA 261 Multivariate Calculus
MA 262 Linear Algebra

4. Social and Behavioral Sciences

A. PSY 362 Human Develop. II

B. 9-12 credits from the following with at least three credits from each of two areas:

History

HIST 104 Intro. Modern World
HIST 110 The Pre-Modern World
HIST 151 American History
HIST 152 U. S. Since 1877
HIST 271 Latin American History
HIST 272 Latin American History
HIST 397 The Afro-American

Political Science

POL 100 American Public Affairs
POL 101 American Government
POL 130 Intro. International Relations
POL 141 Intro. Comparative Politics
POL 370 Intro. Comparative State Politics

Economics

ECON 210 Principles of Economics
ECON 251 Microeconomics

Sociology & Anthropology

ANTH 105 Intro. Cultural Anthropology
ANTH 341 Culture & Personality
SOC 100 Intro. Sociology
SOC 220 Social Problems
SOC 340 General Social Psychology

Psychology

PSY 120 Elementary Psychology
PSY 344 Human Sexuality
PSY 350 Abnormal Psychology
PSY 361 Human Development I

5. General Science Education

A. SCI 300 Interdisciplinary Science

B. At least three credits from each of the following outside the primary teaching area:

Biology, Chemistry, Physics, Geoscience

6. Science Teaching Major: student must choose one primary and one supporting area:

For Biology as the primary teaching area:

BIOL 101/102 Intro. Biology
BIOL 220 (221) Intro. Microbiology
BIOL 285 Environmental Biology
BIOL 320 Intro. Cell Biology
BIOL 321 Lab. Cell Biology
BIOL 429 Genetics Lab.
BIOL 430 Genetics
One Biology elective 300 level or above

For Chemistry as the primary teaching area (see advisor):

CHM 115/116 General Chemistry
CHM 261 Organic Chemistry
CHM 262 Organic Chemistry
CHM 263 Organic Chemistry Lab.
Note: CHM 111, 112, 223 may replace CHM 115, 116
CHM 264 Organic Chemistry Lab.
CHM 273 Intro. Physical Chemistry
CHM 321 Analytical Chemistry I
CHM 513 Chemical Literature
CHM 290 Selected Topics

For Physics as the primary teaching area (see advisor):

PHYS 152 Mechanics
PHYS 251 Heat, Electricity, & Optics
PHYS 310 Intermediate Mechanics
PHYS 322 Oscillations
PHYS 330 Intermediate Electricity
PHYS 342 Modern Physics
PHYS 343 Modern Physics Lab.
PHYS 350 Intermediate Lab.
PHYS 351 Intermediate Lab.

Supporting areas

For Biology as the supporting area:

BIOL 101/102 Intro. Biology
BIOL 220 (221) Intro. Microbiology
BIOL 285 Environmental Biology
BIOL 429 Genetics Lab.
BIOL 430 Genetics

For Chemistry as the supporting area (see advisor):

CHM 111/112 General Chemistry OR CHM 115/116 General Chemistry
CHM 251 Organic Chemistry
CHM 252 Organic Chemistry Lab.
CHM 223 Intro. Qualit. Analysis
CHM 224 Intro. Quant. Analysis OR CHM 333 Principles of Biochemistry

For Physics as the supporting area (see advisor):

PHYS 152 Mechanics
PHYS 251 Heat, Electricity, & Optics
PHYS 342 Modern Physics
PHYS 343 Modern Physics Lab.

And one of:

PHYS 310 Intermediate Mechanics
PHYS 322 Oscillations
PHYS 330 Intermediate Electricity
PHYS 350 Intermediate Lab.
PHYS 351 Intermediate Lab.

For General Science as the supporting area:

GEOS 361 Intermediate Astronomy

15 additional credits in areas outside primary area including, Physics, Chemistry, or Biology, in addition to those courses listed in general education requirements.

For Mathematics as the supporting area:

MA 163/164 Integrated Calc. & Geom. I/II
MA 261 Multivariate Calculus
MA 262 Linear Algebra
MA 560 Fundamental Concepts Geom.

7. Professional Education

EDFA 101 Intro. Foundations Education
EDCI 203 Teaching Learning Seminar
EDPS 220 Psychology of Learning
EDFA 221 Society/Professional Professional Education
EDCI 303 Teaching Learning Seminar
EDCI 309 Reading Middle/Secondary
EDCI 355 Teaching Learning in High School
EDPS 498 Supervised Teaching
EDCI 491 Topics and Issues

Bachelor of Science, Medical Technology (124 credits)

1. Communications

ENGL 103 Adv. Freshman Comp. OR ENGL 104/105 English Comp. I/II

ENGL 104 English Comp. I (Grade of A)
AND English Writing/Literature elective
(Recommended: ENGL 220 Tech. Report Writing)

2. Science and Mathematics

Biology

BIOL 101/102 Intro. Biology
BIOL 221 Intro. Microbiology
BIOL 320 Intro. Cell Biology
BIOL 321 Lab. in Intro. Cell Biology
BIOL 429 Genetics
BIOL 430 Genetics Lab. (Optional)

Chemistry Choose A or B

A. For most students

CHM 111/112 General Chemistry
CHM 223 Intro. Qualit. Analysis
CHM 255 Organic Chemistry
CHM 254 Organic Chemistry Lab.
CHM 256 Organic Chemistry
CHM 258 Organic Chemistry Lab.

CHM 333 Principles Biochemistry OR CHM 224 Intro. Quant. Analysis

B. For students with strong high school chemistry background:.

CHM 115 General Chemistry
CHM 116 General Chemistry

Choose Group 1 or 2:

1.
CHM 254 Organic Chemistry Lab.
CHM 255 Organic Chemistry
CHM 256 Organic Chemistry
CHM 258 Organic Chemistry Lab.

2.
CHM 261 Organic Chemistry
CHM 262 Organic Chemistry
CHM 263 Organic Chemistry Lab.
CHM 264 Organic Chemistry Lab.

CHM 333 Principles Biochemistry OR CHM 224 Intro. Quant. Analysis

Physics Choose A or B

A.

PHYS 220/221 General Physics

B.

PHYS 152 Mechanics
PHYS 251 Heat, Electricity, & Optics
PHYS 342 Modern Physics
PHYS 343 Modern Physics Lab.

Mathematics Choose A or B

A. For most students:

MA 223/224 Intro. Analysis I/II
STAT 301 Elementary Statistics

One of:

CIS 200 Computer Programming Fund.
CIS 204 Intro. Computer-Based Systems
CS 171 FORTRAN
CS 191 Pascal

B. For students with strong mathematics background:

MA 163/164 Integrated Calc. Geom. I/II

One of:

CIS 200 Computer Programming Fund.
CIS 204 Intro. Computer-Based Systems
STAT 301 Elementary Statistical Methods
CS 171 FORTRAN
CS 191 Pascal

3. Humanities/Behavioral Sciences

6 credits from any two of the following, including a two-course sequence; foreign language highly recommended:

A. literature, philosophy, creative arts
B. history, political science
C. economics, sociology, psychology
D. modern language (up to 6 credits.)

4. Biology electives (9-10 credits) from:

BIOL 340	Human Physiology	BIOL 527	General Mycology
BIOL 357	Intro. Animal Physiology	BIOL 533	Medical Microbiology
BIOL 507	Molecular Biology	BIOL 534	Lab. in Medical Microbiology
BIOL 508	Recomb. DNA Techniques	BIOL 561	Immunology
BIOL 524	Microbiology	BIOL 595	Animal Tissue Culture
BIOL 525	Neurobiology	BIOL 595	Food Microbiology

5. Successful completion of 12 month clinical program at an affiliated hospital (32 credits).

Note: Students must register for "Candidate Only" at PUC at beginning of semester in which they expect to complete the B.S. (usually advanced registration period or delayed for summer semester)

General Agriculture Transfer Program (60 credits)

More than 40 programs are offered by the School of Agriculture, Purdue University West Lafayette. Calumet students may complete 1-2 years of study in these programs by taking coursework offered through the Biology Department at Purdue University Calumet. Students can then transfer to the Lafayette Campus to complete a bachelor's degree. Requirements vary in different agriculture options. See advisor for further details. Following is a sample program.

1. Communications

ENGL 104/105	English Comp. I/II	OR	ENGL 103 Adv. Freshman Comp.
COM 114	Fundamentals of Speech		One COM elective

2. Science and Mathematics

Science:

CHM 111/112	General Chemistry	BIOL 108	Biology of Plants
CHM 251	Organic Chemistry	BIOL 109	Biology of Animal
CHM 252	Organic Chemistry	AGRY 429	Genetics*
BIOL 220	Intro. Microbiology*	AGRY 430	Genetics*
		STAT 301	Elementary Statistical Methods*

Math:

MA 153/154	Algebra & Trig. I/II	OR	MA 223/224	Intro. Analysis I/II *

*Not required in all programs

3. Electives (six courses)

Preforestry Transfer Program (60 credits)

Students may qualify for admission to the Department of Forestry and Natural Resources, School of Agriculture, at Purdue University West Lafayette by completing two years of courses offered through the Department of Biology at Purdue University Calumet.

1. Communications

ENGL 104/105	English Comp. I/II	OR	ENGL 103 Adv. Freshman Comp.
COM 114	Fundamentals of Speech		One COM elective

2. Science and Mathematics

Students with inadequate preparation in mathematics need MA 153 & MA 154 in addition to the following.

Math:

MA 223/224 Intro. Analysis I/II

STAT 301 Elementary Statistical Methods

Chemistry:

CHM 111/112 General Chemistry

Biology:

BIOL 108 Biology of Plants

BIOL 109 Biology of Animals

Chemistry, Physics, or Math elective *(see advisor).*

3. Civil Engineering

CET 104 Elementary Surveying

4. Economics

ECON 210 Principles of Economics OR ECON 217 Economics

5. Electives (four)

Recommended:

MGMT 200 Intro. Accounting

ANSC 221 Intro. Animal Nutrition

CS 171 FORTRAN

Transfer Program in Preveterinary Science and Medicine (60 credits)

Students may qualify for admission to the School of Veterinary Medicine at Purdue University West Lafayette by completing two years of courses at Purdue University Calumet and then transferring to West Lafayette. There students are advised to have alternative objectives in mind, since only a limited number of candidates can expect admission to Veterinary Medicine. Alternatively, a four-year baccalaureate degree in Biology may be followed by a two- or three-year tracked program in DVM clinical education. See academic advisor for details.

1. Communications

ENGL 104/105 English Comp. I/II OR ENGL 103 Adv. Freshman Comp.

COM 114 Fundamentals of Speech

2. Science and Mathematics

Science:

CHM 111/112/116 General Chemistry
OR
CHM 115/116 General Chemistry
CHM 254 Organic Chemistry Lab.
CHM 255 Organic Chemistry
CHM 256 Organic Chemistry
CHM 258 Organic Chemistry Lab.

BIOL 101/102 Intro. Biology OR
BIOL 108 Biology of Plants AND
BIOL 109 Biology of Animals
BIOL 429 Genetics Lab.
BIOL 430 Genetics
PHYS 220/221 General Physics

Mathematics:

MA 223/224 Intro. Analysis I/II OR
MA 163/164 Integrated Calculus Geom. I/II

STAT 301 Elementary Statistical Methods

3. Concentrating Electives

ANSC 221 Intro. Animal Nutrition (highly recommended)
CIS 204 Intro. Computer-Based Systems (recommended)

4. Humanities Electives (9 credit hours):

English, Communications, Foreign Languages, Psychology, Philosophy, Creative Arts, Education, Sociology, Political Science, Economics (ECON 210 Macroeconomics highly recommended), History

Pre-optometry Transfer Program (90 credits min.)

1. Communications

ENGL 104 English Comp. I OR ENGL 103 Adv. Freshman Comp.

2. Science And Mathematics

Mathematics

MA 163 Integrated Calculus Geom. I

STAT 301 Elementary Statistical Methods

Physics

PHYS 220/221 General Physics OR PHYS 218/219 General Physics

Chemistry

CHM 111/112 General Chemistry OR CHM 115/116 General Chemistry

Biology

BIOL 109 Biology of Animals OR BIOL 101/102 Intro. Biology

BIOL 203/204 Human Anat. and Physiology

One of:

BIOL 221 Intro. Microbiology
BIOL 340 Human Physiology

BIOL/AGRY 429 Genetics Lab
BIOL/AGRY 430 Genetics

3. Humanities and Social Science

Two arts and humanities courses

PSY 120 Intro. Psychology and one PSY elective

Two behavioral sciences electives

Foreign language: 101, 102

Prepharmacy Transfer Program (30-60 credits)

This program is designed specifically for Purdue University Calumet students who expect to apply for admission to the Purdue University West Lafayette School of Pharmacy and Pharmacal Sciences after one or two years of study. Ordinarily, only students with a C+ average will be considered for transfer and admission to the West Lafayette program.

For transfer after one year, students must take at least 30 credits, including:

ENGL 104/105 English Comp. I/II
CHM 115/116 General Chemistry OR
CHM 111/112/116 General Chemistry
MA 223 (224) Intro. Analysis I/II OR
MA 163(164) Integrated Calc. Geom. I/II

BIOL 108 Biology of Plants
BIOL 109 Biology of Animal
CIS 204 Intro. Computer-Based Sys.
ECON 210 Principles Economics

For transfer after two years, students must take at least 64 credits, including the above plus:

CHM 254 Organic Chemistry Lab.
CHM 255 Organic Chemistry
CHM 256 Organic Chemistry
CHM 258 Organic Chemistry Lab.

PHYS 220/221 General Physics
BIOL 221 Intro. Microbiology

Students applying after the second year should note that the number of students admitted with advanced standing is limited.

Prephysical Therapy Transfer Program (64 credits)

Students at Purdue Calumet may complete the first two years of a four-year physical therapy curriculum and transfer for the last two years to an accredited program such as that at the Indiana University School of Medicine. Courses listed below will fulfill the requirements at I.U.

1. Communications

ENGL 104 English Comp. I OR ENGL 103 Adv. Freshman Comp.
COM 115 Fund. Public Speaking

2. Science and Mathematics

Math:

STAT 301 Elementary Statistical Methods
(prereq. MA 148 or 154)

Biology:

BIOL 109 Biology of Animals OR BIOL 101/102 Intro. Biology

BIOL 203/204 Human Anat. and Physiology

Chemistry and Physics. Choose A, B, or C:

A.

CHM 111/112 General Chemistry — CHM 116 General Chemistry
CHM 251 Organic Chemistry

B.

CHM 115/116 General Chemistry — CHM 251 Organic Chemistry

C.

PHYS 218/219 General Physics OR PHYS 220/221 General Physics

3. Humanities and Social Sciences

SOC 100 Intro. Sociology
PSY 120 Elementary Psychology
One additional course in Psychology
One elective from literature, philosophy, or fine arts

4. Electives

Recommended: CIS 204 and 205 or CS 220

Transfer Program in Preoccupational Therapy (61 credits)

Admission to the Preoccupational Therapy Program at the Bachelor's level is based on the cumulative grade-point average of previous college work and a personal interview. This checklist is based on requirements established for the Preoccupational Therapy Program at Indiana University. Accepted students must successfully complete prerequisite courses prior to being eligible to begin the professional program.

1. Communications

ENGL 103 Advanced Freshman Comp. OR ENGL 104 English Comp. I
COM 115 Fund. Public Speaking

2. Science and Mathematics

Science:

Biology:

BIOL 101/102 Intro. Biology OR BIOL 109 Biology of Animals

BIOL 203/204 Human Anat. and Physiology
BIOL 340 Human Physiology

Chemistry:

CHM 111/112 General Chemistry OR CHM 115/116 General Chemistry

Mathematics:

MA 153/154 Algebra & Trig. I/II OR MA 147/148 Algebra & Trig. for Tech. I/II

STAT 301 Elementary Statistical Methods

Master of Science in Biology and in Biology Teaching (30 credits)

Special Admission Requirements: Graduate Record Examination (GRE) scores.

Degree Requirements:

1. **Plan of study**: A plan of study should be submitted to Graduate School shortly after acceptance into the program. A Graduate Advisory Committee will work closely with the student to design a program suited to student's needs.

2a. Non-Thesis Option: 21 credits in primary area at 500-600 level and nine credits in supporting area such as Statistics, Computer Science, Chemistry, or Physics. For teaching, secondary area must be education.

2b. Thesis Option: Fewer courses, but more research credits. The student submits a formal research proposal, conducts the research, writes a thesis, and defends it before a committee.

3. One credit seminar in biology.

4. **Cumulative index required**: 4.8 or higher. Degree must be completed in 10 semesters.

Transfer of credit: No more than three courses accepted from other institutions, no more than 10 years prior to completion of degree program may be accepted for supporting area.

Department of Chemistry and Physics

H. Roland Heydegger, Head

Faculty:

A. H. Carlson
C. C. Chancey
P. V. Flannery (Emeritus)
R. R. Fryer (Emeritus)
L. C. Gibson
P. D. Gupta
S. K. Gupta
K. E. Kavana
M. O. Longas
G. R. Mitchell (Emeritus)
N. K. Nelson (Emeritus)
J. Pan
M. W. Pelter
J. R. Phillips
T. J. Phillips (Emeritus)
A. K. Roebuck (Emeritus)
F. Susienka
M. Svonavec (Emeritus)
N. D. Yaney (Emeritus)

The Department of Chemistry and Physics offers programs that lead to careers in an expanding field with a variety of beginning and advanced level professional possibilities. The curricula for these majors are sufficiently flexible that students may shape their own toward any one of a variety of career goals, including graduate study in the primary or related field and Secondary School Science Teaching.

Special areas of strength in the department are environmental chemistry, biochemistry, theoretical inorganic chemistry, and nuclear and cosmochemistry.

The department sponsors the student affiliate Chapter of the American Chemical Society, which regularly hosts seminars, lectures, and other special events, such as meetings with respected scientists from across the country.

Cooperative Education options are available for qualified students, alternating classroom learning with on-the-job experience and helping students to pay for their education. The Parallel Education Program allows students to work part-time while attending school part-time.

Programs

Associate in Applied Science, Chemical Technology, options in general industrial, pharmaceutical, biochemical technology

Bachelor of Science in Chemistry*

Bachelor of Science, Chemistry, options in chemical quality assurance, chemical management, chemistry as a primary or secondary teaching area

Bachelor of Science, Physics, physics as a primary or secondary teaching area

**Certified by American Chemical Society for students planning graduate study in chemistry or preparing for an industrial career as a chemist.*

Associate in Applied Science, Chemical Technology, options in general industrial, pharmaceutical, biochemical technology (67-68 credits)

Required for all options:

1. Communications

ENGL 104 English Comp. I
ENGL 220 Technical Report Writing
COM 114 Fundamentals of Speech

2. Science and Mathematics

Science:

CHM 111	General Chemistry	CHM 251	Organic Chemistry
CHM 112	General Chemistry	CHM 252	Organic Chemistry Lab.
CHM 215	Health & Safety in Lab.	CHM 273	Intro. Physical Chemistry
CHM 223	Intro. Qualit. Analysis	CHT 225	Instrument. Quant. Analysis
CHM 224	Intro. Quant. Analysis		

Math:

MA 147	Algebra & Trig. I	STAT 301	Elementary Statistical Methods
MA 148	Algebra & Trig. II	CIS 204	Intro. Computer-Based Systems

3. Humanities and Social Sciences

SPV 252 Human Relations in SPV

General Industrial Option (67 credits)

Requirements for the Associate degree plus:

CHT 201	Unit Operations	PHYS 218	General Physics I
CHT 202	Individual Project	PHYS 219	General Physics II
MA 221	Calculus for Technology I		

Pharmaceutical Option (68 credits)

Requirements for the Associate degree plus:

BIOL 101	Intro. Biology I	PCTX 201	Intro. Pharmacy
BIOL 102	Intro. Biology II	PCTX 301	Intro. Toxicology
CHM 333	Intro. Biochemistry		

Biochemical Technology Option (68 credits)

Requirements for the Associate degree plus:

BIOL 101	Intro. Biology I	CHM 333	Intro. Biochemistry
BIOL 102	Intro. Biology II	CHM 320	Biochemistry Technical Lab.
BIOL 221	Intro. Microbiology		

Bachelor of Science, Chemistry, all options except teaching (124)

1. Communications

ENGL 103 Adv. Freshman Comp. OR
ENGL 104 English Comp. I (Grade of A)
AND English elective OR
ENGL 104/105 English Comp. I/II

2. Science and Mathematics

A. Science:

CHM 115	General Chemistry I	CHM 374	Physical Chemistry II
CHM 116	General Chemistry II	CHM 376	Physical Chem. Lab.
CHM 261	Organic Chemistry I	CHM 321	Analytical Chem. I
CHM 262	Organic Chemistry II	CHM 424	Analytical Chem. II
CHM 265	Organic Chem. Lab. I	PHYS 152	Mechanics
CHM 266	Organic Chem. Lab. II	PHYS 251	Heat, Electricity & Optics
CHM 373	Physical Chemistry I	CHM 215	Laboratory Health & Safety

B. Two courses, preferably in sequence, in Biology or Geoscience.

Exception: with departmental permission, computer science or engineering courses may be substituted.

C. Math:
MA 163 Integrated Calculus & Geom. I
MA 164 Integrated Calculus & Geom. II
MA 261 Multivariate Calculus

3. Humanities and Social Sciences

A two course sequence from any group, two courses from another group, and any two other courses from A, B, or C:
A. Literature, Philosophy, Aesthetics
B. History, Political Science
C. Economics, Sociology, Psychology

Chemistry Major Option (124 credits)

Requirements for the Bachelor's degree plus:

CHM 220 General Chemistry III

See advisor for electives to complement specified courses with those preparing for premedical, predental, preveterinary, prepharmacy and prelaw.

Chemical Management Option (124 credits)

Requirements for Bachelor's degree plus:

CHM 220 General Chemistry III
CIS 204 Computers in Business I
CIS 205 Computers in Business II
IET 204 Quality Control
IET 224 Production Planning
SPV 252 Human Relations in Supervision
ECON 210 Intro. Economics
ECON 251 Microeconomics
MGMT 200 Intro. Accounting
MGMT 201 Cost Accounting
MGMT 305 Business Statistics
MGMT 324 Marketing
MGMT 455 Business Law I
HIST 334 History of Science & Technology
HIST 374 Economic History
electives (16 cr)

Chemical Quality Assurance Option (124 credits)

Requirements for Bachelor's degree plus:

CHM 220 General Chemistry III
CIS 204 Computers in Business I
CIS 205 Computers in Business II
COM 115 Fundamentals Public Speaking
ECON 251 Microeconomics
ECON 252 Macroeconomics
HIST 334 History of Science & Technology
HIST 374 Economic History
STAT 301 Elem. Statistical Methods
MGMT 200 Intro. Accounting
MGMT 201 Cost Accounting
IET 204 Techniques Maint. Quality
IET 224 Production Planning & Control I
IET 355 Statistical Process Control I
IET 365 Statistical Process Control II
MFET 135 Manufacturing Processes

Bachelor of Science in Chemistry Option (124 credits)

Requirements for Bachelor's degree plus:

CHM 241 Intro. Inorganic Chemistry
CHM 342 Inorganic Chemistry
CHM 513 Chemical Literature
MA 262 Linear Algebra & Diff. Equat.
PHYS 342 Modern Physics
PHYS 343 Modern Physics Lab.
6 credits of Advanced Chemistry
GER 101 German I
GER 102 German II
GER 201 German III
GER 202 German IV or
GER 244 4th Course Sci. German
Electives (0-2 cr.)

Bachelor of Science, Chemistry as a primary or secondary teaching area: See advisor

Bachelor of Science, Physics (124 credits)

1. Communications

ENGL 103 Adv. Freshman Comp. OR
ENGL 104 English Comp. I (Grade of A)
AND English elective OR
ENGL 104/105 English Comp. I/II

2. Science and Mathematics

A. Science:

CHM 115 General Chemistry I — CHM 116 General Chemistry II

B. Two courses, preferably in sequence, in Biology or Geoscience. Exception: with departmental permission, computer science or engineering courses may be substituted.

C. Math:

MA 163 Integrated Calculus & Geom. I — MA 261 Multivariate Calculus
MA 164 Integrated Calculus & Geom. II

Math Electives (6 cr.) Advanced Math, Computer Science, or Statistics Recommended courses:

MA 362 Topics Advanced Calculus OR — MA 510 Advanced Calculus
AND
MA 352 Intermediate Linear Algebra OR — MA 422 Diff. Equat. Engr. Phys. Sci.

3. Humanities and Social Sciences

A two course sequence from any group, two courses from another group, and any two other courses from a, b, or c:

A. Literature, philosophy, aesthetics
B. History, Political Science
C. Economics, Sociology, Psychology

4. Physics

A. Required:

PHYS 152 Mechanics
PHYS 251 Heat, Electricity, & Optics
PHYS 310 Intermediate Mechanics
PHYS 322 Oscillations & Waves
PHYS 330 Intermediate Elect. Magnet.
PHYS 342 Modern Physics
PHYS 343 Modern Physics Lab.
PHYS 350 Intermediate Lab.
PHYS 351 Intermediate Lab. II
PHYS 515 Thermodynamics
PHYS 550 Intro. Quantum Mechanics

B. Electives (27-30 cr.)

Bachelor of Science in Physics, Primary or Secondary Teaching Area (124 cr.): See advisor.

Department of Communication and Creative Arts

Michael R. Moore, Head

Faculty

K. P. Bacus,
T. M. Carilli
Y. S. Chambers (Emeritus)
M. Dakich
M. E. Dixon
D. M. Dunn
L. R. Goodman
Y. R. Kamalipour
J. A. Leslie
J. A. Mohamed
M. B. O'Connor
T. J. Roach
W. L. Robinson

Programs in the Department of Communication and Creative Arts prepare students to work in careers that require exceptional skill in dealing with people. The department offers broad curricula ranging from the scientific study of communication to the performing and creative arts, with strong liberal arts education supporting specific preparation for a variety of careers in communication professions. Students can select minors within the department to serve as professional, creative, and artistic supplements to their majors.

Majors in the department find careers in such fields as sales, advertising, marketing, electronic media, personnel, organizational development, corporate training, broadcasting, public relations, journalism, and teaching.

Internships, practica, and cooperative education options give majors the opportunity to expand their learning and career networks by working directly with professionals in organizations such as commercial radio and television stations, (cable TV and production agencies), print media outlets, advertising and public relations firms.

The radio and full-color television studio on campus allows students hands-on experience in electronic media.

Programs

Bachelor of Arts, Communication, with options in General Communication, Organizational Communication, and Public Relations

Bachelor of Arts, Radio and Television

Bachelor of Arts, Speech Communication and Theatre Teaching

General Speech Minor

Speech Communication and Theatre Teaching Minor

Master of Arts, Communication

Bachelor of Arts, Communication (126 credits)

Required for all Bachelor's degrees in Communication:

1. Communications

ENGL 103 Adv. Freshman Comp. OR
ENGL 104/105 English Comp. I/II
COM 114 Fundamentals of Speech
Foreign Language 101–102–201–202

2. Science and Mathematics

Twelve credits in science and mathematics with a minimum of three credits in each. No sequence required. Computer Science or Logic acceptable for mathematics.

3. Humanities and Social Science

One course of each from:

Literature	Political Science
Philosophy (not logic)	Psychology 120
History	Sociology 100 or
Aesthetics	Anthropology
Economics	

General Communication Option (126 credits)

Requirements for Bachelor's degree plus:

1. Communication Core (24 credits)

A.

COM 214	Theories International Comm.	COM 318	Principles of Persuasion
COM 225	Intro. Rhetoric & Social Influence	COM 320	Group Discussion
COM 300	Intro. Research in Comm.	COM 420	Organizational Comm.

B.

COM 250	Mass Comm. Society	OR	COM 201	Intro. Mass Media

C. One of:

COM 314	Advanced Public Speaking	COM 343	Fundamentals Oral Interpretation
COM 323	Business/Professional Speaking		

2. Electives (45-48 credits)

Organizational Communications Option (126 credits)

Requirements for Bachelor's degree plus:

1. Communication Core

2. Organizational Communication Requirements

A.

BHS 201	Statistical Methods	COM 325	Interviewing
COM 253	Intro. Public Relations		

B. Two of:

COM 255	Intro. News Writing/Editing	COM 459	Publications Editing
ENGL 420	Business Writing	COM 583	Research/Assessment Org. Comm.

C. One of:

OBHR 430	Labor Relations	PSY 374	Organizational Behavior
OBHR 431	Personnel Relations	SPV 252	Human Relations in Supervision
PSY 373	Psychology of Work Behavior		

D. One of:

COM 310	Family Communication	OBHR 330	Behavioral Science
COM 350	Interracial Communication	OBHR 440	Social Responsibility Business
COM 355	Intro. Advertising	PHIL 324	Ethics for the Professions
COM 365	Communication and Aging	SPV 350	Applied Creativity
COM 371	Health Communication		

3. Electives (24-27 credits)

Public Relations Option (126 credits)

Requirements for Bachelor's degree plus:

1. Communication Core

2. Public Relations Requirements

A.

COM 253	Intro. Public Relations	COM 353	Problems in Public Relations
COM 255	Intro. News Writing/Editing	COM 460	Advance Public Relations

B. Two of:

A&D 207	Photography I	COM 352	Mass Communication Law
COM 202	Electronic Media	COM 355	Intro. Advertising
COM 335	Media Graphics	COM 436	Script Writing
COM 337	Video Production/Editing	COM 459	Publications Editing

C. One of:

COM 325	Interviewing	COM 430	Broadcast Sales
COM 331	Radio Production	ENGL 420	Business Writing
COM 332	T.V. Production	IET 404	Industrial Organization
COM 334	Journalism Electronic Media	PHIL 120	Critical Thinking
COM 350	Interracial Communication	PSY 374	Organizational Behavior
COM 365	Communication and Aging	PSY 386	Consumer Behavior
COM 371	Health Communication	SPV 350	Applied Creativity

3. Electives (24-27 credits)

Bachelor of Arts, Radio and Television (126 credits)

Requirements for the Bachelor's degree plus:

1. Radio and Television Requirements

A.

COM 201	Intro. Mass Media	COM 332	Television Production
COM 202	Electronic Media	COM 352	Mass Communication Law
COM 330	Theories in Mass Communication	COM 354	Radio-television Performance
COM 331	Radio Production	COM 436	Script Writing

B. Three of:

COM 250	Mass Communication & Society	COM 441	Advanced Television Production
COM 355	Fundamentals of Advertising	COM 532	Telecommunications Sys. Mgmt.
COM 430	Broadcast Sales	COM 533	Documentary Television

C. Two of:

COM 253	Intro. Public Relations	COM 530	Broadcast Journalism
COM 255	Intro. News Writing & Editing	COM 536	Radio and Television Writing
COM 325	Interviewing	COM 590	Broadcast Programming
COM 334	Journalism for Electronic Media		

D. Two of:

COM 213	Voice Diction	COM 323	Business & Professional Spkg.
COM 225	Intro. Rhetoric	COM 343	Fundamentals Oral Interpretation
COM 300	Intro. Research in Communication	COM 365	Communication and Aging
COM 318	Principles of Persuasion	THTR 230	Acting I
COM 320	Group Discussion		

E. One of:

ENGL 376	The Movies	ENGL 387	Hist. of Film to Present
ENGL 386	History of Film to 1938		

Bachelor of Arts, Speech Communication and Theatre Teaching (126-127 credits)

Requirements for the Bachelor's degree plus:

I. Speech Communication and Theatre Requirements

A.

AUS 115	Intro. Communicative Disorders	COM 318	Principles of Persuasion
COM 202	Electronic Media	COM 320	Group Discussion
COM 210	Debating Public Issues	COM 343	Fundamentals Oral Interpretation
COM 213	Voice and Diction	COM 545	Theories Oral Interpretation
COM 214	Theories Interpersonal Comm.	THTR 136	Rehearsal Performance I
COM 254	Radio-television Performance	THTR 168	Theatre Production
COM 314	Advanced Public Speaking		

B. One of:

THTR 336	Rehearsal Perform. II	THTR 368	Theatre Prod. II

C. One of:

COM 250	Mass Comm. and Society	COM 537	Educational/Institutional T.V.
COM 345	Advanced Interpretation: Prose	THTR 230	Acting I
COM 346	Advanced Interpretation: Drama		

2. Education Requirements

EDFA 101	Intro. Foundations Education	EDCI 342*	Strategies of For. Lang. Instr.
EDCI 203	Teaching & Learning	EDCI 355*	Teaching & Learning
EDPS 220	Psychology of Learning	EDPS 498*	Supervised Teaching
EDFA 221	Society, School & Prof.	EDPS 491*	Special Education
EDCI 303*	Teaching & Learning	EDCI 491*	Computers in Classroom
EDCI 309*	Reading	PSY 362	Human Development II

** Admission to Teacher Education required prior to registration in courses indicated.*

General Speech Minor (12 credits)

Any twelve Communication credits

Speech Communication and Theatre Teaching Minor (23-24 credits)

A.

COM 115	Fundamentals Public Speaking	COM 545	Theories Oral Interpretation
COM 210	Debating Public Issues		
COM 320	Group Discussion		
COM 343	Fundamentals Oral Interpretation		

B. One of:

COM 213	Voice & Diction	AUS 115	Intro. Communication Disorders

C. One of:

COM 314	Advanced Public Speaking	THTR 230	Acting I
THTR 136	Rehearsal and Performance and	THTR 168	Theatre Production I

D. One of:

COM 202	Electronic Media	COM 254	Radio/Television Performance
COM 537	Educational/Institutional T.V.		

Master of Arts in Communication (36 credits)

(effective Fall, 1992)

Degree Requirements

1. Completion of one option:

a. Non-Thesis option: 36 semester credits of approved graduate course work, including Core courses. A maximum of 12 credits of course work may be completed outside the department.

b. Thesis Option: 24 semester credits of approved graduate course work, including Core courses, a second three-hour course in methodological preparation such as COM 582, COM 583, or COM 584 prior to thesis, and 6 credits of COM 698 Thesis Research.

2. GPA of 5.0/6.0 for continuation in Graduate School.

3. Comprehensive examinations for all students.

Course requirements:

1. Core Courses:

COM 512	Theories of Interpersonal Comm.	COM 559	Curr. Trends in Mass Comm. Res.
COM 521	Theories of Rhetoric	COM 590	Intro. to Grad. Studies
COM 545	Theories of Oral Interpretation		(if no undergraduate research course)

2. Electives:

COM 508	Nonverbal Communication	COM 540	Advanced Oral Interpretation
COM 517	Communication in Politics	COM 560	Rhetorical Dimensions Mass Med.
COM 518	Theories of Persuasion	COM 574	Organizational Communication
COM 520	Small Group Communication	COM 582	Descriptive Experiential Research
COM 525	Advanced Interviewing	COM 583	Research Organizational Comm.
COM 531	Special Topics in Mass Comm.	COM 584	Historical/Critical Research
COM 532	Telecommunications Sys. Mgmt.	COM 612	Sem.: Sp. Topics Interper. Comm.
COM 533	Documentary Television	COM 621	Sem.: Sp. Topics Rhetorical Thry.
COM 534	Comparative Telecomm. Systems	COM 632	Sem.: Sp. Topics Mass Comm.
COM 536	Radio T.V. Writing	COM 674	Sem.: Sp. Topics Org. Comm.
COM 537	Educational/Institutional T.V		

Transfer of credit: A maximum of 12 transfer graduate credit may be applied toward degree requirements. These credits must have been earned at an accredited institution and relate to the student's plan of study. Such credits must not have been used to fulfill previous degree requirements. Courses used in a previous program may fulfill course requirements but not credit hour requirements.

Department of Construction Technology

Dennis P. Korchek, Head

Faculty:

R. E. Bennet III
E. A. Dudek
R. E. Evans
W. F. Glowicki (Emeritus)
A. M. Gregory
C. J. McAllister (Emeritus)
B. M. Meeker (Emeritus)
N. G. Scarlatis

The Department of Construction Technology provides distinctive educational programs and experiences in architectural engineering, civil engineering, and construction technologies. The department's programs educate students so that their university training provides a foundation for professional competence and advancement in the field of engineering technology, and so that students will continue to develop their professional skills and advance into positions of increasing responsibility.

All programs develop the aesthetic sensitivity of students about social-environmental systems, instill an awareness of professional ethics, develop analytical and practical competence, and provide a breadth of knowledge in the humanities and social and natural sciences.

Faculty in the department are qualified professionals with considerable experience in various areas. They include registered architects, a licensed general contractor and real estate broker, registered professional engineers, and a land surveyor. Some of their recent projects include research in pre-fabricated housing systems using passive heating and the computer-aided design of the granite panels for the Vietnam Veterans Memorial in Washington, D.C.

Programs

Associate in Applied Science,* options in Civil Engineering, Architectural Engineering Technology

Bachelor of Science in Construction Technology*

**Accredited by Technology Accreditation Commission of the Accreditation Board for Engineering and Technology*

Associate in Applied Science, Civil Engineering Technology (69 credits)

1. Communications

ENGL 104 English Comp. I
ENGL 220 Technical Report Writing
COM 115 Fundamentals Public Speaking

2. Science and Mathematics

Science:

PHYS 218 General Physics
PHYS 219 General Physics

Math:

MA 147 Algebra & Trig. I
MA 148 Algebra & Trig. II
MA 221 Calculus

3. Management

ECON 210 Principles of Economics

4. Achitectural Enginering Technology

ARET 117 Construction Drafting
ARET 120 Freehand Drawing
ARET 170 Materials & Sytems
ARET 150 Architectural Construction I

5. Civil Engineering Technology

CET 100 Technical Computations
CET 104 Elementary Surveying
CET 160 Statics
CET 208 Route Surveying
CET 253 Hydraulics & Drainage
CET 260 Strength of Materials
CET 209 Land Survey & Subdiv.
CET 266 Materials Testing
CET 280 Structural Calculations

Associate in Applied Science, Architectural Engineering Technology (69 credits)

1. Communications

ENGL 104 English Comp. I
ENGL 220 Technical Report Writing
COM 115 Fundamentals Public Speaking.

2. Science and Mathematics

Science:

PHYS 218 General Physics
PHYS 219 General Physics

Math:

MA 147 Algebra & Trig. I
MA 148 Algebra & Trig. II
MA 221 Calculus

3. Management

ECON 210 Principles of Economics

4. Architectural Engineering Technology

ARET 117 Construction Drafting
ARET 120 Freehand Drawing
ARET 170 Materials & Systems
ARET 150 Architectural Construction I
ARET 222 Architectural Construction II
ARET 284 Mechanical Equip. of Buildings
ARET 285 Electrical Equip. of Buildings

5. Civil Engineering Technology

CET 100 Technical Computations
CET 104 Elementary Surveying
CET 160 Statics
CET 260 Strength of Materials
CET 266 Materials Testing
CET 280 Structural Calculations

Bachelor of Science, Construction Technology (134 credits)

Either of the above AAS programs plus:

1. Construction Technology and related areas

CNT 341 Construction Operations
CNT 344 Construction Inspection
CNT 380 Quantity Survey & Estimating
CNT 450 Construction Scheduling
CNT 489 Senior Project Survey
CNT 445 Construction Management
CNT 490 Senior Project
CET 331 Property & Behavior of Soils
CET 386 Reinforced Concrete Construction
ARET 376 Specification & Contract Doc.
IET 450 Production Cost Analysis
MGMT 200 Intro. Accounting

2. Communications

ENGL 420 Business Writing
COM 315 Comm. of Technical Information

3. Mathematics

One Math elective: any course above MA 221 or STAT 301

4. Construction electives (3 courses)

Recommended:

CET 208	Route Surveying	CET 432	Foundation Construction
CET 209	Land Surveying & Subdiv.	ARET 284	Mechanical Equipment Bldgs.
CET 253	Hydrulics & Drainage	ARET 285	Electricity for Bldgs.
CET 306	Construction Surveying	ARET 360	Community Planning I
CET 382	Steel Construction	ARET 362	Community Planning II
CET 384	Wood Construction	ARET 425	Solar Construction
CET 408	Construction of Highways	ARET 435	Building Rehabilitation
CET 409	Property Surveying		

5. Science

One Science elective: any lab science approved by department

6. General Education

Two general education electives from: Economics, Psychology, Philosophy, Sciology, Political Science, History, Foreign Languages, Anthropology, Art History

7. One Free Elective

Department of Education

Leah T. Engelhardt, Head

Faculty:

H. R. Adesiyan
R. D. Bechtel (Emeritus)
J. R. Billard
R. J. Colon
L. M. Crawford
J. E. Davis
D. J. Delph (Emeritus)
W. V. Giddings
S. E. Gorski
K. E. Griswold (Emeritus)
R. C. Hayes (Emeritus)
V. S. Jacobsen (Emeritus)
D. E. Johnson (Emeritus)
S. McAuliffe
T. Mihail
M. L. Nortman
S. D. Paravonian
C. Reed
R. H. Rivers
R. L. Roames
W. H. Smead (Emeritus)
J. O. Smith
C. Trimble (Emeritus)
E. L. Vockell

The Department of Education, in collaboration with other professional educators and agencies, prepares and supports education professionals and related specialists who:

- are advocates and models of quality education and lifelong learning
- are sensitive and responsive to the unique needs of themselves, of others, and of the diverse society in which they practice
- are prepared to use current information and technology to empower the people they serve
- apply the appropriate knowledge, skills, and attitudes in developing diverse approaches to educational strategies that are constructive, consistent, and reflective of sound practice.

The department faculty is committed to providing the human and technological resources to enable students and themselves to become humanly competent and competently human.

All programs are fully accredited by the National Council for the Accreditation of Teacher Education (NCATE) and meet state standards for certification. Each program includes an integrated sequence of theory and practice, with most undergraduate teacher education courses including laboratory experiences. Field experiences in multi-cultural settings are required. Emphasis is placed on developing professional competencies as well as skills in interpersonal relationships.

The Teacher Education programs include a general education component, a major in elementary education or a subject and electives which may be used to add teaching endorsements. The professional education courses have a spiraling design, beginning with exploratory activities in the freshman year and culminating with ten-week full-time supervised teaching experience.

Master's degree programs are individually planned to meet the student's certification requirements and professional interests.

Internships are available for students in areas such as educational administration or counseling to provide practical field experiences under professional supervision. Practica are available for students seeking endorsements in learning disabilities, emotionally disturbed, kindergarten, and junior high/middle school. The media/instructional development practicum, a supervised field experience in school media centers or in programs involving instructional development activities, is available to students in the School Media Services Program and the Educational Media Program.

Other practica experiences are offered in Reading for the Classroom Teacher, at the undergraduate level, and in Remedial Reading and counseling and personnel services at the graduate level.

Supporting Facilities. The Teacher Education Services Office serves undergraduates and graduates during and after their attendance at Purdue Calumet, supervising admission of undergraduates to Teacher Education and arranging field experiences, including student teaching. It also recommends students for certification and advises graduates of employment opportunities through its placement services.

The Educational Media Center, located in Gyte 143, the Reading Improvement Center in X-127, and the Science Laboratory in E-103 all support the department's programs. The Teacher Education Resource Center in the Purdue Calumet Library contains print and non-print materials used by faculty, graduate and undergraduate students.

Programs

Teacher Certification programs:

Bachelor of Arts, Elementary Education (Gr. 1-6); endorsements in audio-visual services, bilingual/bicultural/ junior high/middle school, kindergarten, learning disabilities, library services, reading, visual arts

Bachelor of Arts, Bachelor of Science, Senior High, Junior High, Middle School; majors in biology, chemistry, economics, English, French, general sciences,, German, government, mathematics, physics, psychology, school media services, sociology, Spanish, speech communication and theater, United States history, world civilization

Minors in audio-visual services, English, French, German, Spanish, learning disabilities, library services, mathematics, reading, chemistry, general science, physics, social studies, speech communication and theater

Master of Science, Elementary Education, Secondary Education, Educational Administration, Instructional Design, Counseling and Personnel Services

Additional Certification Areas: Instructional Supervision-Reading, Elementary School Administration, Secondary School Administration, Counseling

Admission, Retention and Certification Standards for all Teacher Education programs:

Admissions Standards

To be admitted to a Purdue University Calumet Teacher Education program, the applicant must meet the following minimum standards:

1. In good standing at Purdue University Calumet.

2. A minimum of 30 semester credits of course work, 8 credits of which must have been earned at Purdue University.

3. A minimum cumulative index of 4.50 in the teaching major and teaching minor (if any), in English composition courses required by the school awarding the degree, and in required mathematics courses (elementary majors only). Students may be required to demonstrate proficiency in English by passing a composition examination.

4. Minimum of 6 credits in education from EDFA 101, EDPS 220, EDFA 221, and EDPS 260 or equivalent. EDPS 220 must be completed before or taken during the semester in which the student is admitted to teacher education.

5. Speech and hearing analysis if so advised.

6. PreProfessional Skills Test with passing grade.

7. Evidence of satisfactory completion of an Advisory Committee Interview.

A secondary student whose index in the major or minor falls between 4.25 and 4.50 may submit scores from the appropriate specialty area test(s) of the National Teachers Examination in lieu of taking courses to raise the index. Acceptable NTE scores must meet the minimum cutoff scores established by the State of Indiana.

Retention Standards

Admission to a Teacher Education curriculum does not insure retention in the program or approval for the professional semester, taken during the senior year and including professional education courses and student teaching. The student's progress will be reviewed by the Certification Officer after the completion of 90 semesters credits of course work. This review will determine whether the academic standards as established by the Teacher Education Council have been met for admission to the professional semester and student teaching.

To be retained in the Teacher Education program and be approved for admission to the professional semester, the student must meet the following requirements:

1. In good standing at Purdue University Calumet.

2. Complete 90 semester credits of course work.

3. Minimum cumulative index of 4.50 in each of the following: Teaching Major/Teaching Minor/Mathematics courses required (elementary only)/Graduation Index

4. C or better, a minimum cumulative index of 4.50 in any completed education courses, required English Composition courses, and mathematics courses (elementary only).

5. Evidence of follow-up on any problems identified in the speech and hearing analysis as required for admission to Teacher Education.

Certification Standards

Students will be recommended for standard teacher certification in Indiana, and in other states where such a recommendation is accepted, when they have met the following requirements:

1. Completed a program of Teacher Education.

2. Earned a bachelor's degree.

3. Maintained a minimum cumulative index of 4.50 in each of the following: Teaching Major/Teaching Minor (if any)/Graduation Index.

4. Achieved passing scores on the National Teachers Examination as required by the Indiana State Department of Education.

5. Earned a C (pass) or higher in student teaching. Earned a C or higher in all education courses and maintained a minimum cumulative index of 4.50 in all education courses.

The Certification Advisor has the authority to make decisions in areas where the adopted standards of admission, retention and certification do not adequately address the individual's situations.

Exception. A secondary student whose index in the major or minor falls between 4.25 and 4.50 may submit scores from the appropriate specialty area test(s) of the National Teachers Examination in lieu of taking courses to raise the index. Acceptable NTE scores must meet the minimum cutoff scores established by the State of Indiana.

Special Students. Undergraduate students from institutions other than Purdue University desiring to earn student teaching credit from Purdue University Calumet shall follow these procedures:

1. Submit a letter from the degree-granting institution indicating that the student has met all prerequisites for student teaching and has permission to complete student teaching at Purdue University Calumet for transfer to the degree granting institution.

2. Complete the appropriate Advisory Committee Interview.

3. Enroll in no less than the professional semester, or its equivalent, at Purdue University Calumet.

4. Have the recommendation of the department in which the major is offered.

Certification Students. A student with a baccalaureate degree seeking teacher certification through Purdue University Calumet, including student teaching, must:

1. Be admitted as a special undergraduate student or as a regular graduate student.

2. Have the recommendation of the department in which the major is offered.

3. Complete the appropriate Advisory Committee Interview.

4. Be admitted to Teacher Education.

5. Complete six credits of Teacher Education courses at Purdue University Calumet prior to enrolling in the student teaching semester.

Students must file an application for student teaching by February 1 prior to the academic year in which they plan to do student teaching. Applications for student teaching will be accepted only from students who have been admitted to Teacher Education.

Note:

1. Any elementary education student re-entering the program after not having been registered for two or more years must meet the revised admission and retention certification standards.

2. The standards listed above do not apply to the School Nurse program.

Bachelor of Arts, Elementary Education (129 credits)

1. Communications

A.

ENGL 104 English Comp. I
ENGL 105 English Comp. II OR
ENGL 103 Adv. Freshman Comp.

COM 114 Fundamentals of Speech

State certification requires 9 credits in oral and written expression.

B. Foreign Language (12 credits):101-102-201-202

2. Humanities and Social Sciences

ENGL 260 or 261 Intro World Literature
Aesthetics

MUS 203 Music for Elementary Teachers
HIST 151 United States History OR

HIST 104 Intro. Modern World

HIST 152 United States Since 1877

A&D 203 Art Activities Elemen. Teachers
PSY 120 Elementary Psychology
Political Science

ECON 210 Principles of Economics
PSY 361 Human Development
Sociology or Anthropology

Any Philosophy with exception of PHIL 150 (Recommend PHIL 106)

AUS 215 Intro. Comm. Disorders OR

EDPS 260 Intro. Special Education

3. Science and Math

MA 135 Math for Elementary Teachers A

MA 136 Math for Elementary Teachers B

One of:

BIOL 101 Intro. Biology
BIOL 203 Human Anatomy & Physiology

BIOL 211 Social Impact Biological Science

One of:

PHYS 107 Conceptual Physics Humanity
PHYS 108 Conceptual Physics Humanity

One of:

BIOL 212 Social Impact Biological Science
BIOL 295A Special Assignments
BIOL 482 Biological Conservation
CHM 131 Chemistry & Ecology

One of:

GEOS 110 Survey of Geology
GEOS 220 Survey Physical Geography

4. Nutrition, Recreation, and Health

Five credits from:

F&N 303 Essentials of Nutrition
BHS 260 Nutrition for Human Development
HPER 217 Physical Education Programs
HPER 280 Principles of First Aid
HPER 301 Recreation Leadership Principles
HPER 319 Physical Growth

5. Education Requirements

EDFA 101 Intro. Foundations of Education
EDCI 200/201 Teaching & Learning
EDPS 220 Psychology of Learning
EDFA 221 Society, School, & Educator
EDCI 300/301 Teaching & Learning
EDCI 306 Teaching Reading
EDCI 307 Corrective Reading
EDCI 311 Media for Children
EDCI 329 Teaching Language Arts
EDCI 330 Teaching Math & Science
EDPS 498 Supervised Teaching

Three credits from:

EDPS 491 Topics & Issues in Education
EDCI 491 Topics & Issues in Education
EDFA 491 Topics & Issues in Education

(One credit in EDPS 491 Exceptional Learner if EDPS 260 not selected in Area II)

6. Electives (12 credits)

Additions to the Elementary license are available in: Audio-Visual Services, Bilingual and Bicultural Proficiency, Junior High/Middle School, Kindergarten, Learning Disabilities, Library Services, Reading, Visual Arts.

Junior High/Middle School Certification (Grades 5-9)

Bachelor of Arts, Elementary Education plus:

1. Education requirements

EDCI 499 Supervised Teaching
EDCI 502 Reading Middle/Sec. School
EDCI 581 Curriculum Emerging Adoles.
EDPS 486 Guidance Classroom
PSY 362 Human Develop. II

2. Required course work in a teaching area

Language arts, social studies, Math, science, reading, learning disabilities

School Media Services Certification Option (All-grade Education, K-12)

Secondary teaching degree plus:

1. Requirements for Education major

EDCI 311 Media for Children
EDCI 570 Audio-Visual Media
EDCI 571 Preparation of Instl. Materials
EDCI 573 Media/Instl. Develop. Practicum
EDCI 574 Young Adult Media Reading
EDCI 578 Reference Resources
EDCI 579 Audio-Visual Services
EDCI 582 Cataloging and Classification
EDCI 583 Admin. School Media Programs

2. Twelve credits from one the following options:

A. Radio and T.V. Option

COM 202 Intro. to Electronic Media	COM 332 TV Production
COM 250 Mass Communication & Society	COM 348 Radio & TV Performance
COM 331 Radio Production	COM 537 Educational/Institutional TV

B. English Option. One of:

ENGL 376 The Movies	ENGL 387 History of Film
ENGL 386 History of Film	

Three of:

ENGL 240 Survey English Literature I	ENGL 350 Survey American Literature I
ENGL 241 Survey English Literature II	ENGL 351 Survey American Literature II
ENGL 260 Intro World Literature I	ENGL 372 Intro. American Folklore
ENGL 261 Intro World Literature II	ENGL 456 American Humor

3 Education requirements for degree and certification. See advisor for more detail.

EDFA 101 Intro. Foundations of Ed.	EDCI 303 Teaching & Learning II
EDPS 220 Psychology of Learning	EDCI 309 Reading
EDFA 221 Society, School & Educator	EDCI 498 Supervised Teaching Elementary
EDCI 203 Teaching and Learning	EDCI 491(2) Topics and Issues
EDCI 302 Teaching and Learning Sem	EDCI 580 Foundations Curriculum Devel.

Bachelor of Arts or Bachelor of Science in Secondary Education, Senior High, Junior High, Middle School (Grades 5-12)

Most secondary teaching programs are offered through the academic departments. See appropriate department for further information.

The Education Department provides professional education courses required for secondary education majors. These students should contact the Teacher Education Services Office during the second semester of their freshman year for further information regarding the program.

1. Education courses

EDFA 101 Intro. Foundations of Ed.	EDCI 309 Reading
EDPS 220 Psychology of Learning	EDCI 355 Teaching and Learning
EDFA 221 Society, School & Educator	EDCI 498 Supervised Teaching
EDCI 203 Teaching and Learning	EDCI 491 Computers in Education
EDCI 303 Teaching and Learning	EDCI 491 Special Education

2. Appropriate teaching methods course in major.

3. Appropriate general education courses for degree and certification. See advisor.

4. Appropriate teaching minors or electives, fulfilling degree requirements.

Master of Science, Elementary Education (33 credits)

1. Foundations Block

EDPS 530 Advanced Educational Psych.

One of:

EDPS 531 Intro. Measurement & Eval	EDPS 533 Intro. Educational Research
EDPS 532 Measuring Ed Achievement	

One of:

EDFA500 History & Philosophy of Ed.	EDCI 585 Multicultural Education
EDPS 500 Human Relations Lab	SOC 570 Sociology of Ed.

2. Elementary Core Block

EDCI 681 Elementary School Curriculum

One of:

EDCI 607 Problems Elementary Schools
EDCI 608 Individualizing Instruction

3. Related Elementary Block (9-12 cr.) from:

EDPS 502 Child Guidance
EDCI 500 Foundations Remedial Reading
EDPS 564 Foundations Exceptional Chldrn.
EDCI 504 Children's Literature
EDCI 602 Language Arts
EDCI 602 Language Arts
EDCI 603 Reading Elementary School
EDCI 604 Social Studies
EDCI 605 Science Elementary School
EDCI 606 Math Elementary School

4. Elective Block (6-9 cr.)

Students may select courses related to elementary block but are encouraged to select from outside the Department of Education. Recommended:

A&D 601 Seminar Art Education
MATH 598 Topics Math
PHYS 501 Physical Science I
PHYS 502 Physical Science II

5. Demonstrated competency on departmental exit exam.

Master of Science, Secondary Education (33 credits)

1. Non-Thesis Option

A. One of:

EDFA500 History/Philosophy Education
EDPS 530 Adv. Educational Achievement
SOC 570 Sociology of Education
EDCI 585 Multicultural Education

B. One of:

EDPS 531 Intro. Measurement & Evaluation
EDPS 532 Measuring Ed. Achievement
EDPS 533 Intro. Educational Research I

C. One of:

EDCI 584 Secondary School Curriculum
EDCI 581 Curriculum Emerg. Adolescents

D. One of:

EDCI 608 Individualizing Instruction
EDCI 560 Microcomputers for Education
EDCI 572 Intro. Instructional Development

E. 18 credits in the teaching area where professional certification is desired.

2. Thesis Option

A. One of:

EDFA500 History/Philosophy Education
EDCI 585 Multicultural Education
SOC 570 Sociology of Education

B. Required courses

EDPS 530 Adv. Educational Achievement
PSY 500 Statistics
EDPS 533 Intro. Educational Research I
EDCI 698 Master of Science Thesis

C. Appropriate coursework in teaching area where professional certification is required.

Note: Additional certification options for elementary and secondary include: audio-visual, computer, English, foreign language, learning disabilities, library sciences, mathematics, reading, science, social studies, speech communications, and visual arts.

Master of Science, Counseling & Personnel Services (60 credits)

I. Required courses

EDPS 500 Human Relations
EDPS 501 Intro. Guidance
EDPS 505 Career Theory & Information
EDPS 531 Intro. Measurement & Evaluation
EDPS 616A 1st Field Experience
EDPS 601 Counseling Theories Lab
EDPS 600 Counseling Theories & Tech.
EDPS 606 2nd Field Experience
EDPS 530 Adv. Ed. Psych/Prof. Minor
PSY 500 Statistical Methods
EDPS 610 Counseling Practicum
EDPS 610D Group Counseling Pract.
EDPS 533 Intro. Ed Research 1
Cognate Minor /speciality areas/ Prof. Minor
EDCI 560 Microcomputer
EDPS 614 Adv. Counseling Practicum

2. One of:

EDPS 602 Sem. Theories Group Counseling
EDPS 620 Counseling Seminar

3. One of:

EDPS 606 3rd & 4th Supr. Field Exp.
EDPS 695A Internship in Counseling

Note: Certification program in counseling is also available.

Master of Science, Instructional Design (33 credits)

I. Educational Foundations

EDFA 500 History/Philosophy Education
SOC 570 Sociology of Education
SOC 570 Sociology of Education

2. Other Education Requirements

EDPS 530 Adv. Educational Psychology
EDPS 535 Personal-Social Dynamics
EDPS 531 Intro. Measurement & Evaluation
EDPS 532 Measuring Education
EDPS 533 Intro. Educational Research
PSY 505 Mental Measurement

3. Education electives (6 cr.)

Master of Science, Educational Administration: Elementary (33 credits)

EDFA 500 History/Philosophy Education
EDPS 533 Intro. Educational Research I
EDPS 530 Adv. Educational Achievement
EDFA 512 Found. Educational Admin.
EDPS 502 Child Guidance and Counseling
EDCI 681 Elementary School Curriculum
EDFA 605 Elementary School Admin.
EDFA 609 Legal Aspects of Amer. Ed.
EDFA 610 Supervision Inst. Per.

Six credits of graduate electives in Elem. education methods (required to professionalize elementary teaching licenses in Indiana).

Master of Science, Educational Administration, Secondary (33 credits)

EDFA 500 History/Philosophy Education
EDPS 533 Intro. Educational Research
EDPS 530 Adv. Educational Achievement
EDPS 501 Intro. Guidance
EDFA 512 Found. Educational Admin.
EDFA 604 Secondary School Admin.
EDFA 609 Legal Aspects of Amer. Ed.
EDFA 610 Supervision of Inst. Per.

One of:

EDCI 581 Curriculum for Em. Adol.
EDCI 584 Secondary School Curriculum

Six credits of electives (6 credits of content in teaching area required to professionalize a secondary or K-12 teaching license in Indiana).

Certification Program in Educational Administration Elementary School Principalship (45 credits)

Special Admission Requirements:

1. Master's degree
2. Professional Elem. school teaching certificate
3. Five years teaching experience in an accredited school

Degree Requirements:

EDFA 500 History/Philosophy Education
EDPS 530 Adv. Ed. Achievement
EDFA 512 Found. Ed. Administration
EDFA 516 School Community Rel.
EDFA 605 Elem. School Admin.
EDFA 609 Legal Aspects of Amer. Ed.
EDFA 610 Supervision Instructional Pers.
EDPS 502 Child Guidance and Counseling
EDCI 681 Elementary School Curriculum

One of:
EDPS 531 or 533 Intro Educational Research I

One of:
EDFA 695A Internship in Education OR EDFA 606 School Principalship Seminar

Twelve hours of electives in educational administration or curriculum. Any courses previously completed for graduate credit may be used to fulfill requirements for certification.

Certification Program in Educational Administration: Secondary School Principalship (45 credits)

Special Admission Requirements:

1. Master's degree
2. Professional secondary school teaching certificate
3. Five years of teaching in an accredited school

Degree Requirements

EDFA 500 History/Philosophy Education
EDPS 530 Adv. Educational Achievement
EDFA 512 Found. Ed. Administration
EDFA 516 School Community Relations
EDFA 604 Secondary School Admin.
EDFA 609 Legal Aspects of Amer. Ed.
EDFA 610 Supervision of Inst. Per.

One of:
EDPS 533 Intro. Educational Research I
EDPS 531 Intro. to Meas. & Evaluation

One of:
EDCI 581 Curriculum Emerging Adol.
EDCI 584 Secondary School Curriculum

One of:
EDFA 695A Internship in Education
EDFA 606 School Principalship Seminar

Twelve hours of electives in educational administration or curriculum. Any courses previously completed for graduate credit may be used to fulfill requirements for certification.

Department of Electrical Engineering Technology

C. R. Sekhar, Head

Faculty:

J. P. Agrawal
A. Ahmed
R. L. Anderson (Emeritus)
L. E. Brunner (Emeritus)
O. Farook
A. Hossain
S. B. Jen (Emeritus)
G. L. Kvitek
H. T. Lee (Emeritus)
H. Moghbelli
D. E. Nold
J. C. Rapal (Emeritus)
R. E. Skoog
E. G. Smith
N. M. Sorak
K. H. Steiner (Emeritus)

The Department of Electrical Engineering Technology offers students academic preparation for careers in electronics, computers, telecommunications, electrical power, medical electronics, and process control. The curriculum provides a strong background in technical subjects integrating theory with extensive hands-on laboratory training, mathematics, science, and the liberal arts.

Programs lead to an Associate in Applied Science after two years of full-time study and a Bachelor of Science after an additional two years of full-time study. Students have considerable flexibility to pursue one of several technical options, to attend classes in the day and evening, either on a full- or part-time basis to achieve their educational and professional goals.

Cooperative Education. Qualified electrical engineering technology students may participate in Cooperative Education programs, alternating semesters of full-time study and full-time work with a participating company, to earn money and experience while progressing toward the degree.

Honor Society. Membership in the national honorary society for engineering technology, Tau Alpha Pi, is available to those students meeting the scholastic requirements.

Programs

Associate in Applied Science, Electrical Engineering Technology*

Bachelor of Science in Electrical Engineering Technology,* options in Computer Engineering Technology, Process Control, Telecommunication, Medical Electronics, and Electric Power

**Accredited by Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC-ABET)*

Associate in Applied Science, Electrical Engineering Technology (67-69 credits)

1. Communications

ENGL 104 English Comp. I
COM 115 Fundamentals of Public Speaking

2. Science and Mathematics

MA 150 Math. for Technology
MA 221 Calculus for Technology I
MA 222 Calculus for Technology II
PHYS 218 General Physics

3. Humanities and Social Sciences (3 credits)

One Liberal Arts and Social Sciences elective

4. Professional course requirement

CIS 260 Structured Programming

5. Electrical Engineering Technology

EET 102	Electrical Circuits I	EET 204	Analog Electronics II
EET 105	Digital Fundamentals I	EET 155	Digital Fundamentals II
EET 110	Computer Usage in EET	EET 212	Electrical Power & Machines
EET 152	Electrical Circuits II	EET 354	Microprocessor Fundamentals
EET 154	Analog Electronics I	EET 250	Computer-Aided Fabrications

5. EET elective (3-4 credits)

Recommended:
EET 317 or 417 for Computer Engineering Technology bachelor's degree option
EET 303 for Telecommunications bachelor's degree option
EET 310 for Medical Electronics bachelor's degree option
EET 312 for Electrical Power bachelor's degree option
EET 262 for Process Control bachelor's degree option

Bachelor of Science, Electrical Engineering Technology (127-129 credits)

AAS degree plus:

1. Electrical Engineering Technology

EET 383	Advanced Electrical Networks	EET 491	Senior Design Project II
EET 490	Senior Design Project I		

2. Electrical Engineering Technology electives

Five departmentally approved EET electives, with at least two at the 400 level.

3. Communications

ENGL 220 Technical Report Writing

One of:

COM 315	Speech Comm. of Technical Info.	COM 415	Discussion of Technical Problems

4. Science and Mathematics (10 credits)

MA 322	Advanced Technical Math II	Two science/math electives	

5. Electives

Professional electives (6 credits), Humanities and Social Science electives (9 credits), and free elective (3 credits.)

Bachelor of Science, Electrical Engineering Technology, Computer Engineering Technology Option (127-129 credits)

AAS degree plus:

1. Electrical Engineering Technology

EET 383	Adv. Elec. Networks	EET 456	Microcomp. Hrdwre Design
EET 445	New Tech. Computer Sys.	EET 490	Senior Design Project I
EET 455	Microprocessors II	EET 491	Senior Design Project II

2. Electrical Engineering Technology electives (8 credits)

Two departmentally approved EET electives

3. Communications

ENGL 220 Technical Report Writing

One of:

COM 315	Speech Comm. of Technical Info.	COM 415	Discussion of Technical Problems

4 Science and Mathematics (10 credits)

MA 322	Advanced Technical Math II	Two science/math electives

5. Electives

Professional electives (6 credits), Humanities and Social Science electives (9 credits), and free elective (3 credits)

Bachelor of Science, Electrical Engineering Technology, Telecommunications Option (127-129 credits)

AAS degree plus:

1. Electrical Engineering Technology

EET 383	Advanced Electrical Networks	EET 475	Microwave and Antennas
EET 403	Digital Communication	EET 490	Senior Design Project I
EET 423	Cur. Trends Telecommunication	EET 491	Senior Design Project II

2. Electrical Engineering Technology Electives (8 credits)

Two departmentally approved EET electives

3. Communications

ENGL 220 Technical Report Writing

One of:

COM 315	Speech Comm. of Technical Info.	COM 415	Discussion of Technical Problems

4. Science and Mathematics (10 credits)

MA 322	Advanced Technical Math II	Two science/math electives

5. Electives

Professional electives (6 cr.), Humanities and Social Science electives (9 cr.), and free elective (3 cr.)

Bachelor of Science, Electrical Engineering Technology, Process Control Option (127-129 credits)

AAS degree plus:

1. Electrical Engineering Technology

EET 383	Advanced Electrical Networks	EET 462	Appl. Computers Proc. Control
EET 362	Proc. Control Instrumentation	EET 490	Senior Design Project I
EET 368	Linear Integrated Circuits	EET 491	Senior Design Project Phase II

2. Electrical Engineering Technology Electives (8 credits)

Two departmentally approved EET electives

3. Communications

ENGL 220 Technical Report Writing

One of:

COM 315	Speech Com. Technical Info.	COM 415	Discussion Technical Problems

4. Science and Mathematics (10 credits)

MA 322	Advanced Technical Math II	Two science/math electives

5. Electives

Professional electives (6 credits), Humanities and Social Science electives (9 credits), and free elective (3 credits)

Department of Engineering

Edward S. Pierson, Head

Faculty:

H. A. Abramowitz
B. G. Burridge
E. H. Buyco
I. Eisenstein (Emeritus)
H. L. Gerber
R. L. Gonzales
K. Gopalan
D. L. Gray
T. I. Hentea
N. Houshangi
Y. B. Kin
D. Kozel
S. S. Mahil
M. Mojtahed
J. H. Packer (Emeritus)
B. K. Pai
N. Zubatov

Professional engineering is the art and science of adapting materials found in nature to more useful forms and to harnessing natural forces to do man's work, at a reasonable cost in both time and energy. As a result of education and training, Purdue Calumet's engineering graduates are able to apply the scientific method and perspective to solve problems, create new products, and assume responsibility in the fields of design, development, research, manufacturing, and management.

The Purdue Calumet curriculum leads to a Bachelor of Science in Engineering degree, and is particularly aimed at those students who will work in private industry. The philosophy of this degree is demonstrated in the breadth of the required engineering courses. The first and second year programs are the same for all students—the same electric circuits, microcontrollers, and statics and dynamics. In the third and fourth years, students specialize in Computer and Electrical Engineering, Electrical Engineering, or Mechanical Engineering, but all students take the same courses in materials science, control theory, and senior design. The flexibility of the engineering program allows students interested in other engineering disciplines—aerospace, chemical, civil, etc.—to complete two years of study for transfer to another university, and allows students to design their own programs to meet their career needs through the Interdisciplinary Engineering Option.

Extensive laboratory experience is a key part of the program. Students spend time every semester in laboratory work. The concept of engineering decision-making based on both technical and non-technical factors—economic and societal—is introduced in the first semester and is integrated into later engineering courses.

Engineering classes at Purdue Calumet are small and are taught by faculty members dedicated to teaching. Faculty members supervise hands-on experiences in the university's computer, electrical, and mechanical engineering laboratories. Courses are provided both days and evenings on a publicized schedule to meet the needs of full-time and part-time students.

Senior Engineering Design Projects. A capstone, one-year project for all seniors provides the opportunity to work in teams to pursue an engineering idea from conception to design and, perhaps, fabrication and testing. These senior projects provide a transition from university study to the real world of engineering work. Many of the project ideas come to Purdue Calumet from local industry. Special equipment, such as digital image processing systems, personal computers, programmable controllers, and microcontrollers, is available for senior design projects.

Cooperative Education in Engineering. The coop program provides engineering students with the opportunity to work in the engineering profession while obtaining their degree. The alternation of employment with university study provides students practical experience while earning money to pay for their education. The work experience make the education more meaningful for students and makes students more attractive to employers when they graduate. The new Professional Experience Program provides opportunities for students to gain relevant work experience by part-time employment while attending school part-time.

Programs:

Bachelor of Science in Engineering, options in Computer and Electrical Engineering, Electrical Engineering,* Mechanical Engineering,* Interdisciplinary Engineering

Master of Science in Engineering and Master of Science

**Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology*

Bachelor of Science in Engineering

Special Admission Requirements: Students must have adequate preparation in mathematics and chemistry to complete the freshman year in two semesters.

Math preparation: Students with no high school trigonometry or SAT math below 570 should take MA 151.

Chemistry: Students without one year of high school chemistry or chemistry achievement score of 48 or below should take CHM 111 and CHM 112 instead of CHM 115.

Requirements for all Bachelor's of Science in Engineering degrees:

1. Communications

ENGL 104 English Comp. I
COM 114 Fundamentals of Speech

2. Science and Mathematics

Science:

PHYS 152 Mechanics
PHYS 261 Heat, Electricity, & Optics
PHYS 342 Modern Physics
CHM 115 General Chemistry

Math:

MA 163 Integrated Calculus Geom. I
MA 164 Integrated Calculus Geom. II
MA 261 Multivariate Calculus
MA 262 Linear Algebra

3. Humanities and Social Sciences (18 cr.)

A. Required: PHIL 324 Ethics for the Professions

The balance (15 credits) is selected by the student and advisor to give the student opportunity to explore different areas within a unifying framework for a coherent experience. It is suggested that the student select courses from two different subject areas in two different groups; it is **required** *that at least six credits be taken in the same area to provide some depth as well as breadth.*

Groups:

A. foreign languages, communication, aesthetics

B. history, philosophy, literature

C. economics, political science

D. psychology, sociology, anthropology

Subject areas not acceptable are accounting, industrial management, personal finance, ROTC, personnel administration, and skills courses such as writing and speaking. Introductory language courses accepted only as part of a six-credit sequence. Credit not allowed for a student's native language.

4. Engineering

ENGR 190 Elem. Engineering Design
ENGR 140 Intro. Engineering I
ENGR 160 Intro. Engineering II
ENGR 114 Engineering Drawing
ENGR 233 Microcomputers in Engineering
ENGR 325 Dynamics Physical Systems
ENGR 380 Computers in Engr. Anal.
ENGR 440 Senior Engineering Design I
ENGR 460 Senior Engineering Design II
ENGR 483 Intro. Control Systems
EE 201 Linear Circuit Analysis I
EE 207 Elect. Measurement Techniques
EE 202 Linear Circuit Analysis II
EE 218 Linear Circuits Lab. II
ME 271 Basic Mechanics I—Statics
ME 275 Basic Mechanics II—Dynamics
MSE 200 Materials Science

Bachelor of Science in Engineering, Electrical Engineering Option (133 credits)

EAC ABET Accredited

Requirements for the Bachelor's degree plus:

1. Electrical Engineering:

EE 275	Electronic Devices	EE 335	Electronics-Systems
EE 302	Probl. Methods Elect. Engr.	EE 370	Digital Systems-Logic Design
EE 311	Electronic & Magnetic Fields		

2. Electrical Engineering electives

Two from:

EE 321/322	Principles Electromech. Con.	EE 448	Intro. Communication Theory
EE 330	Intro. Microprocessors		

or other courses approved by Department's Undergraduate Committee.

3. Electrical Engineering elective

One Electrical Engineering course at 300 level or above approved by Department's Undergraduate Committee.

4. Engineering elective

One Engineering course at 300 level or above approved by the Department's Undergraduate Committee.

5. Technical electives

Two from any courses numbered 300 or above in Engineering, Science, Math, Computer Science, Statistics, and Management, approved by Department's Undergraduate Committee, including CE 273.

Bachelor of Science in Engineering, Mechanical Engineering Option (133 credits)

EAC ABET Accredited

Requirements for the Bachelor's degree plus:

1. Mechanical Engineering

CE 273	Mechanics of Materials	ME 345	Mechanical Engineering Expermnt.
ME 305	General Thermodynamics I	ME 416	Heat Transmission
ME 306	General Thermodynamics II	ME 417	Heat Transmission Lab.
ME 312	Fluid Mechanics	ME 461	Mechanical Engineering Design
ME 313	Fluid Mechanics Lab	MSE 344	Materials in Engineering
ME 320	Kinematic Analysis Design		

2. Technical electives

Two courses numbered 300 or above in Engineering, Science, Mathematics, Computer Science, Statistics, and Management, approved by the Department's Undergraduate Committee, including EE 275.

Bachelor of Science in Engineering, Computer and Electrical Engineering Option (132 credits)

Requirements for the Bachelor's degree plus:

1. Electrical Engineering

EE 275	Electronics—Devices	EE 371	Microprocessor Systems
EE 302	Prob. Methods in Elec. Engr.	EE 375	Digital Systems—Electronics
EE 311	Elect. & Magnetic Fields	EE 448	Intro. Communication Theory
EE 330	Digital Systems—Software	EE 466	Design Digital Computers
EE 363	Software Engr.: C Lang.	EE 467	Microprocessor Lab.
EE 370	Digital Systems—Logic Design	EE 468	Design Computer System Prog.

2. Technical elective

One course numbered 300 or above in Engineering, Science, Math, Computer Science, Statistics, Management, approved by the Department's Undergraduate Committee, including CE 273.

Bachelor of Science in Engineering, Interdisciplinary Engineering Option (133 credits minimum)

Requirements for the Bachelor's degree plus:

1. Mechanical Engineering

ME 305 General Thermodynamics I

2. Technical Electives (10 courses):

A. Four technical electives chosen by student and advisor

B. At least four electives in 300-500 level engineering courses

C. No more than two in 300-500 level Science, Math, Computer Science, Statistics, and Management

Master of Science in Engineering, Master of Science (30 credits)

(also: Master of Science in a specific engineering area)

The Committee on Continuing Education in Engineering (CCEE), with representatives from the engineering schools at Purdue West Lafayette and the three regional campuses, is responsible for the overall administration of the program leading to the Master of Science in Engineering and Master of Science degrees. The following instructions apply only to those degrees. Courses are available in civil, electrical, industrial, materials, and mechanical engineering, including control systems, digital systems, energy, metallurgy, and thermal sciences. The program has the flexibility to allow students to elect courses in one or several engineering disciplines.

Graduate courses are taught live by Purdue Calumet faculty or are available on television by Purdue West Lafayette faculty.

Students wishing to pursue a Master of Science in some specific engineering field, such as Master of Science in Electrical Engineering, Master of Science in Industrial Engineering, or Master of Science in Mechanical Engineering are subject to the rules and requirements of the particular Purdue University West Lafayette engineering school which grants the degree. Such degree programs can be completed taking courses at Purdue Calumet only.

Special Admission Requirements

1. Bachelor's degree in engineering from an institution accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). Such students will be admitted to the Master of Science in Engineering program.

Other students having adequate mathematical preparation will be admitted to the Master of Science program.

2. GPA of 5.0 or better. Conditional admission may be granted to students with lower GPA's, with the stipulation that they must achieve a 5.0 or better for the first twelve credits of graduate work. Some students may be advised to complete prerequisite or additional courses. Students not meeting these requirements will be dropped from the program.

3. Post-baccalaureate admission. Students may enroll to meet individual needs for continuing education rather than for pursuing a degree. Enrollment as a post-baccalaureate student does not imply later approval for degree-seeking status, nor does it guarantee acceptance toward a degree of credit taken as a post-baccalaureate student.

Degree requirements

1. **Non-thesis Option**: 30 semester credits, with at least 18 credits of graduate-level engineering courses.

2. **Thesis Option**: 21 semester credits plus thesis.

3. GPA of 5.0 for all courses on the approved plan of study. Some advisory committees may require grades higher than C in specific courses.

4. An advisory committee with at least three members, at least one member to represent a related engineering area, and at least one member from the West Lafayette campus. Students will initially consult with a temporary advisor.

5. A plan of study in the first semester, established in consultation with the major advisor or professor and reviewed by members of the advisory committee, the head of the Department of Engineering at Purdue Calumet, and the chair of the Committee on Continuing Education in Engineering.

Transfer Credit: a maximum of 12 semester credits of courses with grades of B or better and satisfying course requirements on the approved plan of study may be transferred, subject to approval of the advisory committee.

Time limit on reentry: A new plan of study must be approved if a student is inactive in the program for five years, usually excluding courses previously taken.

Department of English and Philosophy

Ruth K. MacDonald, Head

Faculty:

D. H. Barbour
J. Campbell
J. C. Carlisle
M. M. Cleland
D. J. Detmer
M. J. Didelot
M. K. Dobberstein
G. R. Fischer (Emeritus)
K.S. Fleckenstein
C. B. Gartner
B. G. Gawthrop (Emeritus)
R. A. Geimer
C. L. Gribas
J. H. Jackson
T. R. Koenig
S. K. Littleton-Uetz
S. A. Lovin-Boyd
Z. B. Mistri
P. A. Moran (Emeritus)
R. E. Nichols, Jr.
E. M. Schwartz
G. F. Sefler
R. L. Selig
G. M. Sowa
C. S. Stacy
S. Stark (Emeritus)
C. F. Stiglitz
C. B. Tinkham
A. A. Vasquez

The Department of English and Philosophy offers students from all majors in the university coursework in literature, writing and philosophy. The mission of the department is to help students learn to think critically and in-depth about the important issues involved in interpersonal relationships and communicate their thinking in writing.

In freshman reading and writing courses, students are introduced to the demands of college reading and writing so that they will be prepared for the rest of their academic careers and for their lives beyond college. English literature and teaching majors take a variety of literature courses to prepare for careers in teaching or the professions, or to prepare for further, graduate-level study of literature. Writing majors learn the practical aspects of communicating on the job, in business or in industry, to prepare for careers in publishing, editing, writing, and technical communication.

The philosophy major is unique in the state of Indiana, offered cooperatively with Indiana University Northwest, so that students can take advantage of faculty on both campuses. Cross-registering at IUN is easy, and parking permits from one campus are valid on the other.

Both English and Philosophy majors are prepared for careers in business, industry, and the professions with excellent communications skills, fine research methods, and backgrounds in the best thinking and writing that humans have been capable of throughout history.

The program for the master's degree in English is a general literature degree which allows students to specialize in such areas as English and American literature, language arts teaching, linguistics, literary theory, and rhetoric and composition.

Internships and Cooperative Education. The practical nature of these majors is supplemented by internships in local businesses and government agencies and cooperative education experiences, alternating work and study experiences.

Supporting Facilities. The Writing Tutorial Center helps students throughout the university who wish to improve their writing. The department's computer lab offers writing students opportunity for classroom instruction in word processing and the best technology for producing and editing writing, so that students will know how to use technology to write when they finish their college careers.

Programs

Bachelor of Arts, English, options in Literature, Writing, Teaching

Post-Baccalaureate Certificate in Writing

Minors in English, English Teaching

Bachelor of Arts, Philosophy

Minor in Philosophy

Master of Arts, English

Bachelor of Arts, English (126 credits)

Requirements for all Bachelor's degrees:

1. Communications

ENGL 103 Adv. Freshman Comp. or
ENGL 104/105 English Comp. I & II
COM 114 Fundamentals Speech Comm.
Foreign Language: 101–102–201–202

2. Science and Mathematics

Twelve credits in science and mathematics with a minimum of three credits in each. No sequence required. Computer Science or Logic acceptable for mathematics.

3. Humanities and Social Sciences

One course each from:

Literature (ENGL 201 for lit. & teaching options)
Philosophy (not Logic)
History
Aesthetics
Economics 210
Psychology 120
Political Science
Sociology 100 or Anthropology

Bachelor of Arts, English, Literature Option (126 credits)

Requirements for Bachelor's degree plus:

1. Required English courses

ENGL 240 Intro. English Literature I
ENGL 241 Intro. English Literature II
ENGL 350 Intro. American Literature I
ENGL 351 Intro. American Literature II
ENGL 403 Literary Theory

One of:

ENGL 327 English Linguistics
ENGL 328 English Linguistics

2. Literature courses. One from group A, B, or C and two from each remaining group

A. English Literature

ENGL 381 British Novel
ENGL 444 Milton
ENGL 531 English Novel to 1800
ENGL 532 English Novel 19th Century
ENGL 533 Tudor Literature
ENGL 534 17th Century English Literature
ENGL 441 or 541 Chaucer
ENGL 537 English Drama to 1642
ENGL 547 Romantic Movement
ENGL 548 Victorian Literature
ENGL 549 Later Victorian Edwardian Lit.
ENGL 579 Modern Fiction
ENGL 593 Contempory British Fiction
ENGL 542 or 543 Shakespeare's Comedies or Tragedies

B. American Literature

ENGL 355 Afro-American Literature
ENGL 372 American Folklore
ENGL 382 American Novel
ENGL 455 American Thought
ENGL 456 American Humor
ENGL 554 American Renaissance
ENGL 556 19th Cent. American Literature
ENGL 558 Rise of Realism
ENGL 559 Contempory American Fiction
ENGL 578 Modern American Fiction
ENGL 595 Contempory American Fiction

C. Other Literatures

ENGL 310 Intro. Popular Culture
ENGL 320 By and About Women
ENGL 373 Science Fiction
ENGL 376 The Movies
ENGL 383 Modern Drama
ENGL 386 Film History to 1938
ENGL 387 Film History since 1938
ENGL 462 Bible as Literature I
ENGL 463 Bible as Literature II
ENGL 479 Short Story
ENGL 577 Modern English/Amer. Poetry
ENGL 580 Literature & Mod. Thought
ENGL 581 Ethical Problems Modern Lit.
ENGL 584 Literature & Psych. Problems
ENGL 594 Contemporary Poetry
ENGL 595 Language & Literature

3. Electives or minor (33-36 credits)

Bachelor of Arts, English Teaching Option (126 credits)

Requirements for the Bachelor's degree plus:

1. English major courses

COM 255 Intro. News Writing & Editing
ENGL 201 Nature of Literature Study (to be taken as part of CORE requirement)
ENGL 240 Survey English Lit. I
ENGL 260 or 261 World Literature
ENGL 309 and 326 English Linguistics
ENGL 442 or 542 or 543 Shakespeare
ENGL 241 Survey English Lit. II
ENGL 304 Advanced Composition OR
ENGL 491 Comp. for English Teachers
ENGL 350 Survey American Lit. I
ENGL 351 Survey American Lit. II
ENGL 405 Creative Writing OR
ENGL 589 Directed Writing

2. Two electives in English

3. Education Requirements

EDFA 101 Intro. Foundations Education
EDCI 203 Teaching & Learning
EDPS 220 Psychology of Learning
EDFA 221 Society, School & Educator
EDCI 303* Teaching & Learning
EDCI 309* Reading
EDCI 341* English Teaching
EDCI 355* Teaching & Learning
EDPS 498* Supervised Teaching
EDPS 491* Special Education
EDCI 491* Computers in the Classroom
PSY 362 Human Develop. II

**Admission to Teacher Education required prior to registration in courses indicated.*

4. Electives or Minor (3 credits minimum)

Bachelor of Arts, English, Technical Writing Option (126 credits)

Requirements for the Bachelor's degree plus:

1. Major Courses

A.

COM 319 Rhetorical Tradition
ENGL 384 Intro. Modern Discourse
ENGL 385 Professional Writing
ENGL 423 Technical Publications I
ENGL 425 Technical Publications II

B. One of:

ENGL 429 Supervised Writing
ENGL 480 Internship*

* A 5.0 GPA in writing courses required for placement in the internship. Students without this may take the supervised writing course to complete the required number of credits for the degree; following completion of this course with 5.0 or better, students may request placement in the internship.

C. Two of:

CNT 270 Materials & Systems Constr.
EET 214 Electrical Fundamentals
IET 104 or 404 Industrial Organization
ENGR 190 Elementary Engr. Design
CIS 204 Intro. Computer-Based Sys.
IET 288 Robotics Applications

D. One of:

COM 255 Intro. News Writing & Ed.	COM 491D Publications Ed. & Design
COM 451 Magazine Journalism	ENGL 405 Creative Writing

2. Electives or Minor (36-39 credits)

Bachelor of Arts, English, General Writing Option (126 credits)

Requirements for the Bachelor's degree plus:

1. Major Courses

A.

COM 255 Intro. News Writing & Ed.	COM 491D Publications Ed. & Design
COM 319 Rhetorical Tradition	ENGL 384 Intro. Mod. Discourse Theory
COM 451 Magazine Journalism	ENGL 385 Professional Writing

B. One of:

ENGL 480 Internship*	ENGL 589W Directed Writing

* A 5.0 GPA in writing courses required for placement in the internship. Students without this may take the directed writing course to complete the required number of credits for the degree; following completion of this course with 5.0 or better, students may request placement in the internship.

C. Three of:

ENGL 304 Advanced Composition	ENGL 423 Technical Publications I
ENGL 405 Creative Writing	ENGL 425 Technical Publications II
ENGL 420 Business Writing	

2. Electives or Minor (36-39 credits)

Minor in English (12 credits)

Any twelve credits in English beyond English Composition I and II. Students may concentrate in one area, such as Reading, Writing, Literature, Linguistics, Popular Culture, or across areas.

English Teaching Minor (24 credits)

1. Required courses

ENGL 201 Nature of Literature Study	ENGL 304 or 491 Advanced Comp. or
ENGL 327 or 308 English Linguistics	Comp. for English Teaching Majors
COM 114 Fund. Speech Comm.	COM 255 Intro. News Writing & Ed.

2. Other requirements

a. One of:

ENGL 240 Survey English Lit. I	ENGL 241 Survey English Lit. II

b. One of:

ENGL 350 Survey American Lit. I	ENGL 351 Survey American Lit. II

c. One of:

ENGL 260 World Literature I	ENGL 542 Shakespeare's Comedies
ENGL 261 World Literature II	ENGL 543 Shakespeare's Tragedies

Post-Baccalaureate Certificate in Writing (18 credits)

Special Admission Requirements:

Transcript showing a Bachelor's degree from an accredited institution, and indicating successful completion of the basic freshman composition course.

Course Requirements

ENGL 304 Advanced Composition
ENGL 385 Intro. Professional Writing
ENGL 420 Business Writing
ENGL 423 Technical Publications I
ENGL 425 Technical Publications II
CIS 100 Computer Utilization

Bachelor of Arts, Philosophy (126 credits)

1. Communications

ENGL 103 Adv. Freshman Comp. or
ENGL 104/105 English Comp. I & II
COM 114 Fundamentals Speech Comm.
Foreign Language 101-102-201-202

2. Science and Mathematics

Twelve credits in science and mathematics with a minimum of three credits in each. No sequence required. Computer Science or Logic acceptable for mathematics.

3. Humanities and Social Sciences

One course each from:

Literature
Philosophy (not Logic)
History
Aesthetics
Economics 210
Political Science
Psychology 120
Sociology 100 or Anthropology

4. Philosophy

Note: Numbers with "P" prefix designate courses at IUN. PUC students are required to take a minimum of three philosophy courses at IUN.

A. Introductory philosophy
PHIL 110 Intro. to Philosophy (P 100)

B. Ethics. Two of:

PHIL 111 Ethics (P 140)
PHIL 324 Ethics for the Professions
PHIL 325/590 Ethics & Public Health

C. Logic. One of:

PHIL 120 Critical Thinking
PHIL 150 Intro. Logic (P 150)

D. Topic Areas. Two from each group.

Metaphysics

P 221, P 310 Metaphysics
PHIL 206 Phil. of Religion (P 371)
PHIL 219 Existentialism (P 135)
PHIL 221 Philosophy of Science
P145 Social & Political Phil.
P 360 Epistemology

History of Philosophy

PHIL 301 Ancient Philosophy (P 201)
PHIL 303 Modern Philosophy (P 211)

E. Electives. Two of:

PHIL 101 History of Philosophy
PHIL 106 Human Exp. in Art, Lit. & Mus.
PHIL 293 Special Topics
PHIL 306 20th Century Philosophy
P 304 19th Century Philosophy
P 135 Intro. Phenomen. & Existen.
PHIL 590 Directed Readings

5. Electives or minor (42-45 credits)

Minor in Philosophy (12 credits)

Any twelve credits in Philosophy beyond the general education requirements.

Master of Arts, English (33 credits)

Special Admission Requirements:

1. Writing sample
2. Strong undergraduate major or minor in English or equivalent.

Degree Requirements

1. One course in each of the following areas:

Shakespeare
Literary Criticism
English Language Arts
English Linguistics
Early English Literature
Modern British Literature
American Literature

2. Other electives (4 courses)

Non-Thesis Option (27 credits): Substitute a foreign language reading exam for one of the "other electives." Pass M.A. reading-list exam.

Thesis Option (30 credits): Pass foreign language reading exam. Substitute thesis for one elective. Omit M.A. reading-list exam.

Transfer of credit: No more than two courses accepted from other institutions, no more than 10 years prior to completion of degree may be accepted.

Department of Foreign Languages and Literatures

John C. Carlisle, Interim Head

Faculty:

W. R. C. Ade (Emeritus)
G. R. Barrow
M. L. Bolduc
B. E. Kienbaum
C. Ruiz
A. J. Russell
K. E. Tabor
C. Torres-Robles

The programs of the Department of Foreign Languages and Literatures develop students' competence in foreign languages and foster respect for cultural differences among peoples. Languages offered include French, German, Spanish, and Japanese. The department also serves as a regional resource for translation and for information on other cultures.

The department views learning a foreign language and its culture as a way to foster international understanding in an increasingly interdependent world. Students gain an understanding of the contemporary society of the target culture through the history of its literature and its civilization. The programs emphasize strong interpersonal, writing, and speaking skills, a breadth of knowledge, and a sensitivity to language and culture, all of which are assets for careers.

Internships and practica, especially in the international studies option, offer on-the-job experience with international businesses where a foreign language is used. The program's inclusion of a practical range of studies from other professions prepares the student for a real-life application of language skills in career settings.

Language learning in the department is supported by the International Media Center, which features up-to-date technology to help students in learning foreign languages.

Programs

Bachelor of Arts, options in French, German, Spanish, International Studies, Foreign Language Teaching

Minors in French, German, Spanish

Bachelor of Arts, Foreign Language (126 credits)

Requirements for all foreign language degrees:

1. Communications

ENGL 103 Adv. Freshman Comp. OR
ENGL 104/105 English Comp. I/II

COM 114 Fundamentals Speech Comm.

2. Foreign Language

Twelve-hour sequence: French, German, or Spanish 101-102-201-202

3. Science and Mathematics

Twelve credits in science and mathematics with a minimum of three credits in each. No sequence required. Computer Science or Logic acceptable for mathematics.

4. Humanities and Social Science

One course from each:

Literature
Philosophy (not Logic)
History
Aesthetics
Economics
Political Science
Psychology 120
Sociology 100 or Anthropology

Bachelor of Arts, Foreign Language General Emphasis (126 credits)

Requirements for the Bachelor's degree plus:

1. All of the following courses in either French, German, or Spanish:

261 Composition
365 Conversation
465 Intermediate Composition

2. Major Language

Eighteen credits in courses numbered 400 or higher

3. Second Foreign Language (6 credits)

4. Minor and electives

Bachelor of Arts, International Studies Option (126 credits)

Requirements for the Bachelor's degree plus:

1. French, German, Spanish courses

261 Composition
307 Commercial
461 Intermediate Composition
503 Advanced Composition
365 Conversation
465 Intermediate Conversation
504 Advanced Conversation

2. Culture

One of:

413 Culture
450 Civilization
451 Civilization
581 Culture
582 Civilization

3. Major Language electives

4. Career Emphasis

Twelve credits of approved electives from such fields as Anthropology, Behavioral Sciences, Psychology, Computer Information Systems, Communication, Economics, English, History, Management, Political Science, Restaurant, Hotel, and Institutional Management, Supervision, and Industrial Engineering Technology

5. Minor or electives

Bachelor of Arts, Foreign Language Teaching (126 credits)

Requirements for the Bachelor's degree plus:

1. French, German, Spanish courses

261 Composition
461 Intermediate Composition
365 Conversation
465 Intermediate Conversation
504 Advanced Conversation

2. Civilization and Culture courses

One of: FR, GER 450, SPAN 451 or 582 Civilization
One of: FR, GER 581, SPAN 413 or 552 Culture

3. Major language literature

Two courses at the 400 level or above

4. Other major language courses

Six credits in courses at the 400 level or above. Recommended: FLL 464

5. Education requirements

EDFA 101 Intro. Foundations Education	EDCI 342* Strategies of Foreign Lang. Inst.
EDCI 203 Teaching & Learning	EDCI 355* Teaching & Learning
EDPS 220 Psychology of Learning	EDPS 498* Supervised Teaching
EDFA 221 Society, School & Educator	EDPS 491* Special Education
EDCI 303* Teaching & Learning	EDCI 491* Computers in Classroom
EDCI 309* Reading	PSY 362 Human Development II

* *Admission to Teacher Education required prior to registration in courses indicated.*

Foreign Language Minor (12 credits)

Twelve credits beyond foreign language at the 202 level, including:
261 Composition
365 Conversation

Foreign Language Teaching Minor (18 credits)

Eighteen credits beyond foreign language at the 202 level, including:

A.
261 Composition
365 Conversation
465 Intermediate Conversation

B.
450 Civilization OR SPAN 413, 451, 581, 582 Culture

C. Two 400-500 level courses, including one language literature course, including:
EDCI 342 Strategies of Foreign Language Instruction in Secondary Schools
Also recommended:
FLL 464, Comparative Study of Modern Languages

Department of History and Political Science

Doris Pierce, Head

Faculty:

E. D. De Felice
M. W. H. Grote
E. P. Keleher
S. Lerner
H. J. Merry (Emeritus)
J. W. Pringle (Emeritus)
A. D. Sander (Emeritus)
N. L. Trusty
R. A. Van Orman

The Department of History and Political Science offers programs that give students an understanding of the development of civilizations and the process of political behavior within and among nations. The history programs give students an understanding of past institutions, traditions, events, and individuals. Such programs help students to understand the events of their time and to cultivate intellectual integrity.

The programs in political science provide a social scientific understanding of the rights and obligations of the citizen, knowledge of the role and operation of government, and preparation for entry into such professions as law, teaching, and business.

Both history and political science programs help students develop skills in research, writing, and critical analysis. They provide essential preparation for participation in all human activity.

A major in history or political science is excellent preparation for a variety of careers requiring a solid liberal arts background. History and political science majors are well prepared for graduate school, law school, and careers in education, or for positions with businesses, industries, publishing houses, and local, state, and federal agencies.

Practica are available for political science majors, who may spend a semester working in a local government agency to observe how these offices function on a daily basis.

Programs

Bachelor of Arts, History (and pre-law)

Minor in History

Bachelor of Arts, Political Science (and pre-law), option in Criminal Justice

Minors in Political Science, Public Administration

Bachelor of Arts, Social Studies Teaching

Master of Arts, History

Bachelor of Arts, History (126 credits)

Requirements for all Bachelor's degrees:

1. Communications

ENGL 103 Adv. Freshman Comp. OR
ENGL 104/105 English Comp. I/II
COM 114 Fund. Speech Comm.
Foreign Language 101-102-201-202

2. Science and Mathematics

Twelve credits in science and mathematics with a minimum of three credits in each. No sequence required. Computer Science or Logic acceptable for mathematics.

3. Humanities and Social Science

One course each from:

Literature	Economics 210
Philosophy (not Logic)	Political Science
History	Psychology 120
Aesthetics	Sociology 100 or Anthropology

4. History

A. Nine credits of 100 level history courses. Includes the course used to meet requirement #3 above.

B. HIST 582 The Art of History

C. Two period courses from:

HIST 461 Revolutionary Era	HIST 553 Colonial America
HIST 510 Age Absolute Monarch.	HIST 554 Era of Sectionalism
HIST 513 Europe, 1789-1850	HIST 555 Emergence Modern Amer.
HIST 535 Europe, 1850-1914	HIST 564 Modern Amer., 1917-Present
HIST 552 Modern Europe Since 1914	HIST 590A The Amer. Revolution

D. Two topical, area, or national courses from:

HIST 272 Latin Amer. from 1824	HIST 538 Modern Russia
HIST 301 Episodes in Amer. Religious Hist.	HIST 562 Environmentalism
HIST 325 History of Crime in America	HIST 569 History Amer. South
HIST 334 Science & Tech. West. Civ.	HIST 575 Amer. Frontier
HIST 336 History of Organized Crime	HIST 584 Social History of US
HIST 365 Women in Amer.	HIST 586 US Foreign Affairs to 1900
HIST 370 Holocaust	HIST 587 20th Cent. US Foreign Affairs
HIST 374 U.S. Economic History	HIST 589 History of Religion in Amer.
HIST 376 History of Indiana	HIST 592 Early Amer. Intel. History
HIST 397 The Afro-American	HIST 593 20th Century Amer.
HIST 490 Topics in American History	HIST 596 The Amer. City
HIST 525 Problems 20th Cent. Germany	

E. Nine additional credits of history at 200 level or higher

5. Electives or Minor (33-36 credits)

History Minor (15 credits)

Five three-credit History courses, including at least two at the 300-500 level.

Bachelor of Arts, Political Science (126 credits)

Required for all Political Science degrees:

1. Communications

ENGL 103 Adv. Freshman Comp. OR	COM 114 Fundamentals Speech Comm.
ENGL 104/105 English Comp. I/II	Foreign Language 101–102–201–202

2. Science and Mathematics

Twelve credits in science and mathematics with a minimum of three credits in each. No sequence required. Computer Science or Logic acceptable for mathematics.

3. Humanities and Social Science

One course each from:

Literature	Economics 210
Philosophy (not Logic)	Political Science
History	Psychology 120
Aesthetics	Sociology 100 or Anthropology

4. Political Science

POL 101	Amer. Government	POL 190	The Politics of Change
POL 130	Intro. International Relations	POL 300	Intro. to Political Analysis
POL 141	Intro. Comparative Politics		

Nine more credits in Political Science

Note: a minimum of 18 credits of Political Science courses must be at the 300 level or above.

Bachelor of Science, Political Science Option (126 credits)

Requirements for the Bachelor's degree plus:

1. American Politics and Public Policy

At least one course from:

POL 311	Congress and the President	POL 429	Contemp. Political Problems
POL 315	Public Opinion & Elections	POL 460	Judicial Politics
POL 320	Intro Public Policy Analysis	POL 510	Political Parties & Politics
POL 370	Intro Comp. State Politics	POL 511	Congress. Structure
POL 371	Intro Comp. Urban Politics	POL 514	President & Policy Process
POL 401	Practicum Local Government	POL 522	Energy, Pol. Public Policy

2. International Relations & Foreign Affairs

At least one course from::

POL 231	Intro. US Foreign Policy	POL 442	Soviet Political Systems
POL 433	International Organ	POL 530	Theories of International Relations
POL 435	International Law	POL 542	Communist Political Systems
POL 439	US Foreign Policy Making		

3. Political Theory & Analysis

At least one course from:

POL 302	Intro Political Thinking	POL 400	Princ. Emp. Pol. Analysis
POL 312	Amer. Thought	POL 404	Democratic Elitism
POL 333	Reform, Protest & Revolution	POL 454	Selected Problems Matl. Pol.
POL 353	Current Political Ideologies		

4. Electives or Minor (33-39 credits)

Bachelor of Arts, Political Science, Criminal Justice Option (126 credits)

Requirements for the Bachelor's degree in Political Science plus:

1. American Politics and Public Policy

At least one additional course

2. International Relations & Foreign Affairs

At least one additional course

3. Political Theory & Analysis.

At least one additional course

4. Other requirements

A. Required:

SOC 422	Criminology	POL/SOC 343	Intro. to Criminal Justice
HIST 325	History of Crime in Amer	POL/SOC 443	Practicum Criminal Justice
POL 346	Law and Society		

B. One of

POL 354	Civil Liberties	POL 330	Politics of Lake County
POL 460	Judicial Politics	HIST 336	Organized Crime
POL 371	Comparative Urban Politics		

C. One of:

BHS 201	Stat. Methods	SOC 402	Princ. Sociology
SOC 220	Social Problems	SOC 411	Social Stratification
SOC 421	Juvenile Delinquency		

7. Electives or Minor (24 credits)

Political Science Minor (12 credits)

Any twelve credits in Political Science courses at the 200 level or above.

Public Administration Minor (15 credits)

Fifteen credits of selected Political Science courses on public administration.

Bachelor of Arts, Social Studies Teaching (126 credits)

1. Communications

ENGL 103 Adv. Freshman Comp. OR	COM 114 Fund. Speech Comm.
ENGL 104/105 English Comp. I/II	Foreign Language 101-102-201-202

State certification requires 9 credits in oral and written expression

2. Science and Mathematics

Twelve credits in science and mathematics with a minimum of three credits in each. One life science and one physical science required. No sequence required. Computer Science or Logic acceptable for mathematics.

3. Humanities and Social Sciences

One course each from:

Literature	Economics 210
Philosophy (not Logic)	Political Science
History	Psychology 120
Aesthetics	Sociology 100 or Anthropology

4. Social Studies Requirements

A. One Primary Area (18 credits) and two Supporting Areas (12 credits each) selected from: Anthropology, Economics, Government, Psychology, Sociology, U. S. History, and World Civilization.

B. Ten credits in Social Studies courses not from the primary or secondary areas (may be included in Core).

Social Studies Primary and Supporting Areas

Anthropology

Primary Area:	**Supporting Area:**
Offered through transfer credit only.	ANTH 105 Intro. Cultural Anthropology
	Three 3-credit courses in ANTH

Economics

Primary Area:	**Supporting Area:**
ECON 251 Microeconomics	ECON 251 Microeconomics
ECON 252 Macroeconomics	ECON 252 Macroeconomics
ECON 351 Intermediate Microeconomics	ECON 351 Intermediate Microeconomics
Plus four courses from options list below:	Plus one course from options list below:

Options list in Economics:

ECON 375 U.S. Economic History	ECON 530 Money and Finance
ECON 419 Managerial Economics	ECON 534 Intl. Trade Theory
ECON 525 Government & Economy	ECON 560 Economics Health

Note: minimum math prerequisites for this area include MA 153 and MA 225. Senior status recommended for all 500-level courses.

Government

Primary Area:
POL 101 American Government AND
POL 130 Intro. Intl. Relations OR
POL 141 Intro. Comparative Politics
Four additional courses in Political Science

Supporting Area:
POL 101 American Government AND
POL 130 Intro. Intl. Relations OR
POL 141 Intro. Comparative Politics
Two additional courses in Political Science

U. S. History

Primary Area:
HIST 151 Amer. History to 1877
HIST 152 United States Since 1877
Four courses in U. S. History at the 300 level or above, including one period course and one topical course.

Supporting Area:
HIST 151 Amer. History to 1877
HIST 152 United States Since 1877
Two courses in U. S. History at the 300 level or above, including one period course and one topical course.

Psychology

Primary Area:
PSY 120 Elem. Psychology
PSY 361 or 362 Human Develop. I or II
PSY 339 Adv. Social Psychology OR
PSY 340 General Social Psychology
One of:
PSY 344 Human Sexuality
PSY 350 Abnormal Psychology
PSY 428 Drugs and Behavior
Six additional credits in Psychology at the 300 level or above.

Supporting Area:
PSY 120 Elem. Psychology
PSY 361 or 362 Human Develop. I or II
PSY 339 Adv. Social Psychology OR
PSY 340 General Social Psychology
One additional course listed as an option in the Primary Area.

Sociology

Primary Area:
SOC 100 Intro. Sociology
SOC 220 Social Problems
Four courses in Sociology at the 300 or above, excluding SOC 361, 462, 562, and 312.

Supporting Area:
SOC 100 Intro. Sociology
SOC 220 Social Problems
Four courses in Sociology at the 300 or above, excluding SOC 361, 462, 562, and 312.

World Civilization

Primary Area:
HIST 104 The Modern World
HIST 110 The PreModern World
Four courses in World Civilization at the 300 level or above, including one period course and one topical or national course.

Supporting Area:
HIST 104 The Modern World
HIST 100 The PreModern World
Two courses in World Civilization at the 300 level or above, including one period course and one topical or national course.

5. Education Requirements (30 credits)

EDFA 101 Intro. Found. Ed.
EDCI 203 Teaching & Learning
EDPS 220 Psychology of Learning
EDFA 221 Society, School & Prof.
EDCI 303* Teaching and Learning
EDCI 309* Reading
EDCI 347* Social Studies Instr.
EDCI 355* Teaching & Learning
EDPS 498* Supervised Teaching
EDPS 491* Special Education
EDCI 491* Computers in the Classroom
PSY 362 Human Development II

** Requires admission to Teacher Education prior to registration.*

Master of Arts, History (33 credits)

Special Admission requirements (degree students):

1. Scores from the Graduate Record Exam (GRE).
2. Undergraduate History major or strong minor.

Degree requirements:

1. **Non-Thesis degree** (33 cr.) divided into primary area (27 cr.) and related area (6 cr.). Related areas need not be in history.
2. Oral comprehensive examinations after completion of coursework.
3. At least 12 credits of History at 600 level

Transfer of credit:

No more than three courses accepted from other institutions, no more than 10 years prior to completion of degree program may be accepted for supporting area.

Department of Information Systems and Computer Programming

LaVon C. Green,
Acting Head

Faculty:

A. J. Adams
R. O. Foreman
J. A. Hill
D. R. Kurtz
D. M. Larson
J. M. Larson
J. Maniotes
M. D. Moore
J. S. Quasney
N. J. Smith
M. E. Vermaat
C. R. Winer

The department offers academic programs which lead to careers in the computer industry, blending the theoretical with the practical and emphasizing throughout the skills and technology needed to communicate in the business community. The practical, hands-on nature of the programs includes such skills as how to analyze problems, how to design detailed logic diagrams and structured computer programs, how to generate meaningful information, how to debug or repair programs, how to verify accuracy and completeness, and how to evaluate and modify existing programs to meet changing requirements.

Purdue University Calumet has one of the most advanced small university computing environments in the United States.

The campus computer systems, centralized in the computer education building, include microcomputers, mainframes, local area networks, and more than 200 computer terminals. Students who own microcomputers and a modem have access to campus computer facilities 24 hours a day using their telephone lines.

Programs

Associate in Applied Science, Information Systems and Computer Programming

Bachelor of Science in Information Systems and Computer Programming, options in systems programming, systems analysis and design, applications programming

Post-Baccalaureate Certificate in Information Systems and Computer Programming

Associate in Applied Science, Information Systems and Computer Programming (65 credits)

1. Communications

ENGL 104 English Comp. I
ENGL 220 Technical Report Writing
COM 115 Fundamentals Public Speaking

2. Mathematics

*MA 125/126 Business Math I & II**

*For students whose mathematics placement scores do not qualify them for MA 125, MA 113 will be required in place of an elective in the first semester.

3. Computer Information Systems

CIS 204	Intro. Computer-Based Systems*	CIS 253	Applied Database Techniques
CIS 206	Basic Programming	CIS 365	Topics in COBOL
CIS 232	Assembly Language Programming	CIS 251	Commercial Systems
CIS 262	C Programming	CIS 265	COBOL Programming
CIS 252	Systems Analysis & Design	CIS 286	Computer Operating Sys

*Entering majors in the upper one-half of their high school graduating class who have received a minimum of 900 on the SAT and have taken at least one semester of computer

programming at the high school level (or have equivalent programming experience) may substitute CIS 260, Structured Programming, and a free elective in the second semester for CIS 204.

3. Humanities and Social Sciences

A. PHIL 324 Ethics for the Professions

B. One of:

Anthropology	Political Science,
Communications	Psychology
Economics	Sociology

C. One of:

American History	World Literature
English Literature	Fine Arts
Modern Language	Music
Philosophy	Theater
World History	

4. Management

MGMT 200	Intro. Accounting	MGMT 225	Fund. Management Statistics

Notes:

The program requirements are determined by the date a student officially becomes a major. Students need a grade of C or better to advance to the next CIS course. Students must retake courses in which they have not received a C or better before progressing. An incomplete is not a passing grade.

During the A.A.S. program, a maximum of two CIS courses may be repeated because of an unsatisfactory (D or F) grade. These courses may be repeated only once. Withdrawal from a CIS course with an unsatisfactory grade is equivalent to a final grade of F.

No student shall choose the pass/not pass option for a CIS course. Advisor agreement is required for any other course.

Bachelor of Science, Systems Programming Option (60 credits minimum)

AAS degree plus:

1. a. Computer Information Systems

CIS 233	Advanced Assembler	CIS 386	Computer Operating Systems II
CIS 301	Data & File Structures	CIS 486	Systems Programming
CIS 333	Concepts of System Software	CIS 483	Comp. Hardware/Software Sel

1. b. Computer Information Systems/Computer Science electives

Choose at least six courses from:

CIS 345	Computer Graphics	CIS 383	On-Line Programming Techniques
CIS 351	Decision Support & Expert Sys.	CIS 423	Structured Sys. Anal. & Design
CIS 354	Database Sys. Analysis & Design	CIS 426	Applications Software Proj.
CIS 355	Database Sys. Implementation	CIS 460	Programming Systems
CIS 373	Distributed Data Processing Sys.	CS 401	Architecture of Computers

And no more than one from:

CIS 261	RPG Programming	CS 171	Pascal
CIS 264	FORTRAN	CS 191	FORTRAN

2. Mathematics, Science, and Electronics electives

Math elective recommended: calculus or post-calculus

Science or Electronics elective recommended: physics, biology, chemistry, EET 105, EET 214, EE 233

3. Humanities. One of:

Anthropology
Communication
Economics
Political Science
Psychology
Sociology
American History
English Literature
Modern Language
Philosophy
World History
World Literature or
Aesthetics (Music, Fine Arts, Theater)

4. Other requirements

ENGL 423 Tech. Publications Writing
SPV 374 Elements of Supervision
IET 450 Production Cost Analysis

5. Electives (2 courses)

Bachelor of Science, Systems Analysis and Design (60 credits minimum)

AAS degree plus:

1. a. Computer Information Systems

CIS 423 Structured Sys. Analysis/Design
CIS 424 Advanced Structured Techniques
CIS 426 Applied Software Devel. Project
CIS 354 Database Analysis & Design

1. b. Computer Information Systems electives

Four courses, at least three of which must be taken from:

CIS 301 Data & File Structures
CIS 351 Decision Support/Expert Sys
CIS 355 Database Implementation
CIS 373 Distributed Data Processing Sys.
CIS 383 On-line Programming Techniques
CIS 413 EDP Auditing & Control
CIS 483 Hardware/Software Selection

2. Other requirements

Six 200-500 level Management electives. One ECON and one OBHR
ENGL 423 Tech. Publications Writing
COM 325 Interviewing Principles

3. Humanities. One of:

Anthropology
Communication
Economics
Political Science
Psychology
Sociology
American History
English Literature
Modern Language
Philosophy

4. Electives (2 courses)

Bachelor of Science, Applications Programming (60 credits minimum)

AAS degree plus:

1. a. Computer Information Systems

CIS 301 Data & File Structures
CIS 383 On-line Programming Techniques
CIS 423 Structured Sys. Analysis/Design
CIS 354 Database Sys. Analysis & Design
CIS 426 Applied Software Devel. Project

1. b. Computer Information Systems electives

Four courses, at least three of which must be taken from:

CIS 345	Computer Graphics	CIS 373	Distributed Data Processing Sys.
CIS 351	Decision Support/Expert Systems	CIS 460	Programming Systems
CIS 355	Database Sys. Implementation	CIS 483	Hardware/Software Selection

2. Applications Programming elective

One from:

CIS 233	Advanced Assembler	CIS 264	FORTRAN Programming
CIS 261	RPG Programming		

3. Other requirements

SPV 374	Elements of Supervision	ECON elective	
ENGL 423	Tech Publications Editing	IET 450	Production Cost Control
COM 325	Interviewing Principles		

4. General Education electives (2 courses)

5. Management elective

One course in MGMT, ECON, or OBHR at the 200-500 level

6. Other electives (2 courses)

Post-Baccalaureate Certificate in Computer Information Systems (28 credits)

Special Admissions Requirements

1. Transcript showing satisfactory completion of Bachelor degree from an accredited institution, including successful completion of college algebra and accounting courses. Deficiencies may be eliminated while taking the required courses.

2. A grade of C or better required for each course. Students must retake courses in which they have not received a C or better before progressing. An incomplete is not a passing grade.

3. Pass/not pass option not allowed for a CIS course.

1. Required courses

CIS 206	BASIC Programming	CIS 251	Commercial Systems
CIS 204	Intro. Computer-Based Systems	CIS 252	Sys. Analysis & Design
CIS 262	"C" Programming	CIS 265	COBOL Programming

2. Three courses from:

CIS 210	Personal Computer Technology	CIS 355	Database Sys. Implementation
CIS 232	Assembly Language Programming	CIS 365	Topics in COBOL
CIS 233	Advanced Assembler	CIS 373	Distributed Data Processing Sys.
CIS 253	Applied Database Techniques	CIS 383	On-line Programming Techniques
CIS 261	RPG Programming	CIS 386	Computer Operating Systems II
CIS 264	FORTRAN Programming	CIS 413	EDP Auditing and Control
CIS 286	Computer Operating Systems I	CIS 423	Structured Sys. Analysis & Desgn.
CIS 301	Data & File Structures	CIS 424	Advanced Structured Techniques
CIS 333	Concepts of Systems Software	CIS 460	Programming Systems
CIS 345	Computer Graphics	CIS 483	Hardware/Software Selection
CIS 351	Decision Support/Expert Systems	CIS 486	Systems Programming
CIS 354	Database Sys. Analysis & Design		

Department of Management

Feliksas Palubinskas, Head

Faculty:

M. Al-Darayseh
C. Anderson (Emeritus)
C. Barczyk
K. Chen
B. Das
H. Daubek
P. Empey
E. Engle (Emeritus)
G. Falk
J. Furdek
J. Husain
E. Jennings
A. Lindskog
P. McGrath
P. Obi
J. Pawlus
D. Rinke
S. Sil

The Department of Management offers programs to prepare students to advance their careers in business by providing a background in three areas of study:

- liberal arts, to provide students with breadth of vision and perspective for lifelong learning;
- a core of business foundation courses in the different areas of business to provide students with different perspectives of organizations and the environments in which they function;
- a specialty area in business to enhance the student's career goals.

The overall goal of the department's programs is to prepare students for positions of increasing responsibility in business organizations.

Programs

Associate of Science, Business

Bachelor of Science, Industrial Management

Bachelor of Science, Management, with majors in Accounting, Business Economics, Finance, General Management, Human Resources Management, Marketing

Master of Science, Management

Master of Arts, Teaching Economics

Pre Management (36 credits)

Students admitted to the Department of Management must complete the Pre-Management program. These courses must be completed with grades of "C" or better before students will be admitted to their degree and major programs.

I. Communications

ENGL 103 Adv. Freshman Comp. AND another approved English course	OR	ENGL 104/105 English Comp. I/II
COM 114 Fundamentals Speech	OR	COM 115 Fundamentals Public Speaking

2. Science and Mathematics

Science: one lab science course from Biology, Chemistry, Geoscience, or Physics.

Math. One sequence of:

MA 125/126	Business Mathematics I/II	OR	MA 225/226 Calculus for Bus. Econ. I/II (required for students majoring in Industrial Management.)

Computer Science:

CIS 204 Intro. Computer-Based Systems

3. Humanities and Social Sciences

One introductory 3-credit course in Psychology or Sociology

4. Management and Economics

MGMT 101	Intro. to Business	ECON 251	Microeconomics
MGMT 200	Intro. Accounting		

5. Elective (1 course)

One other departmentally approved general education course. Students majoring in Industrial management are required to take a second course in Behavioral Sciences in place of this elective.

Associate of Science, Business (63 credits)

PreManagement courses plus:

l. Ethics

PHIL 111	Ethics	OR	PHIL 324 Ethics for Professions

2. Business courses

MGMT 201	Management Accounting	MGMT 324	Marketing Management
MGMT 354	Legal Foundations of Business	OBHR 330	Behavioral Science in Admin.
MGMT 310	Financial Management	CIS 205	Info. Systems for Mgmt.

3. Electives

Two elective courses approved by program advisor.

Bachelor of Science, Industrial Management (126 credits)

PreManagement courses plus:

1. Required Management and Economics courses

CIS 205	Info. Systems for Management	MGMT 305	Business Statistics
ECON 252	Macroeconomics	MGMT 306	Management Science
ECON 351	Intermediate Microeconomics	MGMT 324	Marketing Management
ECON	one elective	MGMT 350	Intermediate Accounting
MGMT 201	Management Accounting	MGMT 461	Management of Operations
MGMT 225	Fund. Management Statistics	MGMT 450	Business Policy
MGMT 354	Legal Foundations of Business	OBHR 330	Behavioral Science in Admin.
MGMT 310	Financial Management		

2. Humanities

ENGL 420 Business Writing

PHIL 111	Ethics	OR	PHIL 324 Ethics for Professions

3. Electives

One business elective, four general education electives, and two free electives.

4. Management Option

Five required courses in a management option. See B.S. in Management below for options.

Bachelor of Science, Management (126 credits)

PreManagement courses plus:

1. Required Management and Economics courses

CIS 205	Info. Systems for Management	MGMT 310	Financial Management
ECON 252	Macroeconomics	MGMT 360	Production Operation Mgmt.
ECON	one elective	MGMT 324	Marketing Management
MGMT 201	Management Accounting	MGMT 450	Business Policy
MGMT 225	Fund. Management Stats.	OBHR 330	Behavioral Science in Admin.
MGMT 354	Legal Foundations of Business		

2. Humanities

ENGL 420 Business Writing

PHIL 111 Ethics OR PHIL 324 Ethics for Professions

3. Electives

Four business electives from upper division courses in management, economics, and OBHR; five approved general education electives; two approved free electives.

4. Major Courses (6 courses). Choose A, B, C, D, E, or F.

A. Accounting Major

MGMT 350/351 Inter. Accounting I & II MGMT 504 Tax Accounting

Three additional accounting courses approved by accounting academic advisor.

B. Business Economics Major

ECON 351 Intermediate Microeconomics MGMT 305 Business Statistics
ECON 353 Business Cycles

Three other courses approved by business program advisor.

C. General Management Major

At least one upper division course in each of the following areas: accounting, finance, marketing, organizational behavior

Two additional courses from the above as approved by business academic advisor.

D. Finance Major

MGMT 350	Intermediate Accounting	MGMT 340	Corporate Finan. Problems
MGMT 443	Fundamentals of Investments	MGMT 440	Mgmt. of Finan. Institutions

Two additional finance courses approved by finance academic advisor.

E. Human Resources Management Major

OBHR 431 Human Resource Mgmt. OBHR 430 Labor Relations

Four additional courses approved by academic advisor.

F. Marketing Major.

MGMT 425 Marketing Planning & Research

Five marketing courses from:

MGMT 426	Retailing	MGMT 465	Forcasting for Management
MGMT 427	Sales Management.	MGMT 583	Small Business Management.
MGMT 428	Advertising Mangement.	MGMT 590	Directed Readings in Mgmt.

Other courses approved by marketing advisor

Master of Science, Management (48 credits)

Special Admission Requirements:

1. Results from the Graduate Management Admission Test.
2. Recommended: 6 credits of undergraduate calculus.
3. Capacity for management responsibility.

Degree Requirements:

1. Core Requirements

MA 223/224	Diff./Integ. Calculus I/II	MGMT 630	Legal & Social Foundations
ECON 513	Economic Theory	MGMT 631	Human Resource Systems
MGMT 600	Financial Accounting	MGMT 650	Strategic Management
MGMT 601	Managerial Accounting	MGMT 660	Operations Management
MGMT 611	Financial Management II	MGMT 670	Quantitative Methods I
MGMT 620	Marketing Mangement	MGMT 671	Quantitative Methods II

2. Electives (9 credits)

From courses in accounting, finance, marketing, economics, and general management at the 500 level or above. See advisor for list of approved courses.

Master Of Arts, Teaching Economics

See Department of Management for further information.

Transfer of credit:

No more than three courses will be accepted from other institutions, and only if they were taken no more than 10 years prior to completion of degree program.

Department of Manufacturing Engingeering Technologies and Supervision

C. David Rose, Head

Faculty:

G. E. Bock (Emeritus)
E. C. Gallett (Emeritus)
J. B. Higley
C. F. Jenks
A. L. Kaye (Emeritus)
M. A. Kays
L. B. Mapa
R. F. McCormick (Emeritus)
G. P. Neff
D. E. Norris (Emeritus)
R. Ocon
A. J. Parker (Emeritus)
S. L. Tickoo
S. Truchan
D. J. Yovich
M. A. Zahraee

In response to the timely needs of industry, the Department of Manufacturing Engineering Technologies and Supervision offers coursework in modern plant manufacturing and supervisory skills. These programs offer a balance between the traditional and the innovative to ensure a technical education responsive to the changing needs of industry. These programs are not research-oriented; they offer applied, job-related skills. One unique aspect of the programs is that they are available to students on a part-time basis so that students may pursue degrees while working full-time.

Programs

Associate in Applied Science:
- Industrial Engineering Technology*
- Manufacturing Engineering Technology
- Mechanical Engineering Technology*
- Organizational Leadership and Supervision

Bachelor of Science:
- Industrial Engineering Technology*
- Manufacturing Engineering Technology
- Mechanical Engineering Technology*
- Organizational Leadership and Supervision
  - Supervision Major
  - Personnel and Human Resources Major

Certificate in Professional Supervision

**Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology*

Associate in Applied Science, Industrial Engineering Technology (65 credits)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology

This program prepares students for positions performing such tasks as motion study and work simplification, time study and work measurement, quality control and inspection, job evaluation, plant layout, production control, and cost and savings analyses.

1. Communications

ENGL 104 English Comp. I
ENGL 220 Technical Report Writing
COM 115 Fundamentals Public Speaking

2. Science and Mathematics

Math:

MA 147	Algebra & Trig. I	MA 221	Calculus
MA 148	Algebra & Trig. II	STAT 301	Elementary Statistics

Science:

CHM 111	General Chemistry	PHYS 218	General Physics

3. Major Requirements

MET 103	Production Drawing & CAD I	IET 120	Systems and Procedures
MET 161	Intro. Computers & CAD	IET 204	Techniques of Maint. Quality
MFET 135	Manufacturing Processes I	IET 224	Production Planning & Control
MFET 180	Manufacturing Materials I	IET 264	Fundamentals Work Design
IET 104	Industrial Organization	SPV 252	Human Relations in Supervision

IET/SPV electives (3 credits)

4. General Education elective (3 credits)

Bachelor of Science, Industrial Engineering Technology (126 credits)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology

This program prepares students for the problem-solving and decision-making tasks in management and for technological positions in such industrial engineering technology areas as production planning and control, work methods analysis and work measurement, quality assurance and control, cost analysis, and systems and procedures analysis.

AAS Industrial Engineering Technology requirements plus:

1. Communications

ENGL 420	Business Writing	*One of*:	
COM 315	Speech Comm. Technical Info.	COM 415	Discussion of Techniques
		SPV 474	Conference Leadership

2. Science and Mathematics

PHYS 219 General Physics

3. Major Requirements

One of:

MET 325	Thermodynamics	MET 329	Applied Heat Transfer

And:

IET 310	Plant Layout & Material Handling	IET 497	Senior Project
IET 355	Statistical Process Control I	EET 214	Electricity Fundamentals
IET 450	Production Cost Analysis	SPV 331	Occupational Safety & Health
IET electives (6 credits)		SPV elective (3 credits)	
Technology electives (6 credits)			

4. General Education

ECON 251 Microeconomics

Electives (9 credits)

Associate in Applied Science, Manufacturing Engineering Technology (68 credits)

This program prepares students for positions in manufacturing engineering departments, plant maintenance, production departments, and other staff groups requiring knowledge of production systems and techniques. Graduates are eligible for certification as associate engineering technicians.

1. Communications

ENGL 104	English Comp. I	COM 115	Fundamentals Public Speaking
ENGL 220	Technical Report Writing		

2. Science and Mathematics

Science:

CHM 111	General Chemistry	PHYS 218	General Physics

Math:

MA 147	Algebra & Trig. for Tech. I	MA 221	Calculus
MA 148	Algebra & Trig. for Tech. II		

3. Major Requirements

MET 103	Production Drawing & CAD I	MFET 180	Manufacturing Materials I
MET 118	Applied Mechanics, Statics	MFET 355	Automation I
MET 161	Intro. Computers & CAD	IET 104	Industrial Organization
MET 205	Production Drawing & CAD II	IET 204	Techniques of Maint. Quality
MET 211	Applied Strength of Materials	IET 264	Fundamentals Work Design
MET 266	Strength of Materials Testing Lab.	EET 214	Electricity Fundamentals
MFET 135	Manufacturing Processes I		

4. General Education elective (3 credits)

Bachelor of Science, Manufacturing Engineering Technology (129 credits)

This program prepares students for careers in manufacturing industries, for positions such as production supervisor, tool designer, manufacturing engineering staff member, and other staff positions that support the production function. The program provides instruction about materials and processes, information processing techniques, and the human relation skills necessary for designing and developing state-of-the-art manufacturing systems.

AAS Manufacturing Engineering Technology requirements plus:

1. Communications

ENGL 423	Technical Publications I	COM 315	Speech Comm. Technical Info.

2. Science and Mathematics

Science: PHYS 219 General Physics

Math:

MA 222	Calculus II	STAT 301	Elementary Statistical Methods

3. Major Requirements

MET 230	Fluid Power	IET 224	Production Planning & Control
MFET 235	Manufacturing Process II	IET 310	Plant Layout Material Handling
MFET 275	Numerical Control Application I	IET 314	Manufacturing Resource Planning
MFET 461	Computer Aided Manufacturing	IET 355	Statistical Process Control I
MFET 465	CAD with Applications	IET 450	Production Cost Analysis
MFET 490	Manufacturing Laboratory	SPV 474	Conference Leadership Training

4. Technical Electives (6 credits)

Two of:

MET 384	Instrumentation	IET 365	Statistical Process Control II
MET 485	Control Systems Components	SPV 332	Fundamentals Industrial Hygiene
IET 277	Automatic Identification	SPV 333	Safety Laws, Codes, Standards
IET 288	Robotic Application	SPV 334	Fire Protection & Storage
IET 318	Robotic Programming	SPV 331	Occupational Safety & Health
IET 344	Applied Simulation		

and others upon departmental approval

5. General electives (6 credits)

Associate in Applied Science, Mechanical Engineering Technology (65 credits)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology

This program prepares students for positions in laboratories, engineering departments, plant maintenance, production departments, and technical sales. With additional experience, graduates may be promoted to positions such as industrial supervision, machine and tool designers, technical buyers, production expeditors, and cost estimators. Graduates are eligible for certification as associate engineering technicians.

1. Communications

ENGL 104	English Comp. I	COM 115	Fundamentals Public Speaking
ENGL 220	Technical Report Writing		

2. Science and Mathematics

Science:

CHM 111	General Chemistry	PHYS 218	General Physics

Math:

MA 147	Algebra & Trig. I	MA 221	Calculus
MA 148	Algebra & Trig. II		

3. Major Requirements

MET 103	Production Drawing & CAD I	MET 218	Applied Mechanics: Dynamics
MET 118	Applied Mechanics: Statics	MET 230	Fluid Power
MET 161	Intro. Computers and CAD	MET 266	Testing Lab
MET 205	Production Drawing and CAD II	MFET 135	Manufacturing Processes I
MET 211	Applied Strength of Materials	MFET 180	Manufacturing Materials I
MET 214	Machine Elements	MET elective	

4. General Education elective (3 credits)

Bachelor of Science, Mechanical Engineering Technology (130 credits)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology

This program prepares students as technologists to fill technical positions in manufacturing and production industries. In some cases, the technologist assists the engineer or scientist in the creation, design, and production of devices and systems. In other situations they perform these tasks on their own.

AAS Mechanical Engineering Technology requirements plus:

1. Communications

ENGL 420 Business Writing
COM 315 Fundamentals Public Speaking

2. Science and Mathematics

Science:
PHYS 219 General Physics

Math:
CIS 200 Computer Programming Fund.
STAT 301 Elementary Statistical Methods
MA 222 Calculus

3. Major Requirements

MET 325 Applied Thermodynamics
MET 329 Applied Heat Transfer
MET 495 Senior Project Survey
MET 497 Senior Project
MET elective (3)
IET 224 Prod. Planning & Control
IET 450 Production Cost Analysis
EET 214 Electricity Fundamentals
SPV 252 Human Relations in Supv.
SPV 331 Occupational Safety and Health
SPV 474 Conference Leadership Training

Technical electives (6 cr.): upper-level MET or MFET courses and others with advisor approval

4. General Education

ECON 251 Microeconomics

Electives (6 cr.) from: foreign languages, history, philosophy, political science, psychology, sociology, and others with advisor approval

Associate in Applied Science, Organizational Leadership and Supervision (63 credits)

This program is designed to meet the needs of individuals who wish to improve their leadership and supervisory skills. It can be tailored to a student's specific career objective.

1. Communications

ENGL 104 English Comp. I
ENGL 220 Technical Report Writing
COM 115 Fundamentals Public Speaking

2. Science and Mathematics

Math:
MA 125 Business Math I
CIS 204 Intro. Computer-Based Systems

3. Humanities and Social Sciences

BHS 201 Statistical Methods
ECON 210 Principles Economics
PSY 120 Elementary Psychology
SOC 100 Intro. Sociology

4. Major Requirements

A. Required courses

SPV 252 Human Relations in SPV
SPV 331 Occupational Safety & Health
SPV 374 Elements Supervisory Mgmt
SPV 375 Basic Method of Training
SPV 376 Supervision & Personnel Problems

IET 104 or IET advisor-approved elective

B. Technical elective (3 credits): any advisor-approved course in Management, Supervision, or Technology

C. Career Specialization electives (15 credits): job-related courses

Bachelor of Science, Organizational Leadership and Supervision, Supervision Major (126 credits)

This program is a continuation of the A.A.S. degree and further enhances a student's leadership and supervisory skills.

AAS Organizational Leadership and Supervision requirements plus:

1. Communications

ENGL 420 Business Writing
COM elective at 300 level or above

2. Science and Mathematics

CIS 205 Information Systems for Mgmt.

Science: one lab science (3 credits)
Math/Science elective (3 credits)

3. Humanities and Social Sciences electives (6 credits)

Recommended: Communication, English, Philosophy, Psychology, Sociology

4. Major Requirements

MGMT 200 Intro. Accounting
MGMT 354 Legal Foundations Business
SPV 350 Applied Creativity Bus. Ind.
SPV 474 Conf. Leadership Training
OBHR 430 Labor Relations
SPV electives (9 credits)
IET/Technical elective (3 credits)

Other Technical elective (3 credits): advisor-approved courses from management, supervision, or technology

5. Other electives with advisor approval (12 credits)

Bachelor of Science, Organizational Leadership and Supervision, Personnel and Human Resources Major (126 credits)

This program is designed to prepare a student for a wide range of jobs dealing with human resources. It can be tailored to the student's specific career objective.

1. Communications

ENGL 104 English Comp. I
ENGL 220 Technical Report Writing
ENGL 420 Business Writing
COM 115 Fundamentals Public Speaking
COM 325 Interviewing: Principles

2. Science and Mathematics

Science: One Math/Science elective and one lab science

Math:

MA 125 Business Math I
CIS 205 Info. Systems for Management
CIS 204 Intro. Computer-Based Systems

One of:

STAT 301 Elementary Statistical Methods
BHS 201 Statistical Methods

3. Humanities and Social Sciences

PSY 120 Elementary Psychology
ECON 210 Principles Economics
PSY 373 Psychology of Work Behavior
PSY 205 Testing & Measurement

4. Major Requirements

SPV 252	Human Relations in SPV	SPV 474	Conference Leadership Train.
SPV 303	Alcohol & Drugs in Workplace	SPV 477	Dispute Resolution
SPV 331	Occupational Safety & Health	SPV 574	Managerial Training & Dev.
SPV 350	Applied Creativity for Business	MGMT 200	Intro. Accounting
SPV 368	Personnel Law	MGMT 354	Legal Background Business
SPV 374	Elements of Supervision	OBHR 430	Labor Relations
SPV 375	Basic Methods of Training	IET 104 or IET advisor-approved elective	
SPV 376	Personnel Problems	IET 272	Job Evaluation

5. Technical electives (21 credits)

Any advisor-approved courses in management, supervision, or technology

6. Electives (12 credits)

With advisor approval.

Certificate in Professional Supervision (24 credits)

This program is an intensive and practical curriculum, providing supervisors with the professional education they need to handle the daily supervisory and technical problems in technical, communications, and human relations fields.

Special admission requirements:

Two years of documented supervision or management experience.

1. Required courses

COM 115	Fundamentals Public Speaking	SPV 252	Human Relations in Supervision
IET 104	Industrial Organization		

2. Electives (15 credits)

Chosen with advisor approval to suit individual student needs. Recommended, such courses as:

SPV 331	Occupational Safety & Health	SPV 474	Conference Leadership Training
SPV 350	Applied Creativity	SPV 376	Supervision & Personnel Probl.
SPV 374	Elements of Supervision		

Note: Courses earned as part of the certificate program apply to the Associate degree and the Bachelor's degree programs.

Department of Mathematics, Computer Science, and Statistics

Catherine M. Murphy, Head

Faculty:

W. J. Barlow
R. D. Bechtel (Emeritus)
H-N Chen
Y. C. Chen
T. S. Chihara
J. J. Coffey
M. Crown
A. Elmendorf
J. E. Forbes (Emeritus)
M. Y. Greenwich
R. J. Hill (Emeritus)
H. Hosek
B. L. Jahr-Schaffrath
N. L. Johnson
W. C. Lordan
J. P. McLaughlin
R. R. Merkovsky
N. Relich (Emeritus)
W. Ruan
R. C. Sheen
J. A. Smith
W. A. Stock (Emeritus)
D. J. Troy
H. B. von Horn (Emeritus)
R. J. Wagenblast
J. A. Wood
E. B. Yackel
J. Yackel
R. L. Yates
E. C. Zacher (Emeritus)

A careers-for-today-and-the-future approach provides the framework for programs in the Department of Mathematics, Computer Science, and Statistics. All programs are based on an understanding of mathematics as one of humankind's most impressive intellectual achievements. Mathematics is a balance of art and science which enriches other areas of human endeavor and draws from these areas some seeds of its own continuing growth. Computer Science and Statistics, with roots deep in the traditions of mathematics, are exciting, rapidly expanding fields which provide the bases for many contemporary applications which affect us daily, in such areas as commerce, industry, medicine, and environmental issues. Within each degree and option, majors choose a blend of mathematics, computer science, and statistics appropriate to building strong foundations for professional development.

Undergraduate majors in the department select from three options of study to meet a variety of interests and goals. The department also offers all students at Purdue Calumet instruction in the areas of mathematical sciences they will need in their chosen fields of study.

Cooperative education opportunities, to alternate study with work in an appropriate mathematics-related position, are available to qualified students. The department's courses are supported by special labs for graphics and computer architecture.

Programs

Bachelor of Science, options in Mathematics, Mathematics and Computer Science, and Mathematics Teaching

Master of Science in the Application of Mathematics

Master of Science, Mathematics, option for Teachers

Bachelor of Science, Mathematics, Mathematics and Computer Science (124 credits)

Requirements for all mathematics degrees:

1. Communications

ENGL 103 Adv. Freshman Comp. OR
ENGL 104 English Comp. I (Grade of A)
and an English elective OR

ENGL 104/105 English Comp. I & II

2. Science and Mathematics

Science: See specific degree option

Math:

MA 163	Integrated Calculus & Geom. I	MA 261	Multivariate Calculus
MA 164	Integrated Calculus & Geom. II	MA 262	Linear Algebra

Note: All Math courses must be passed with a grade of C or better.

3. Humanities and Social Sciences (30 credits)

Six credits from each of four of the five areas, with the other six credits distributed in humanities and social sciences courses by the student:

a. literature, philosophy, aesthetics (MUS 250 THTR 201 PHIL 106 A&D 255 only)
b. history, political science
c. economics
d. sociology, psychology
e. foreign language

Mathematics Option (124 credits)

Requirements for the Bachelor's degree plus:

1. Required Mathematics and Computer Science courses

MA 352	Intermediate Linear Algebra	MA 453	Algebra I
One of:			
CS 171	FORTRAN	CS 191	Pascal

2. Mathematics electives

12 additional credits in the mathematical sciences, including one course in analysis.

3. Minor

18 credits including at least three courses beyond the introductory level.

4. Laboratory Sciences (12-19 credits).

Four lab sciences, preferably two-course sequence in two sciences. Recommended: Biology, Chemistry, Geoscience, and Physics.

Exception: with advisor approval, may substitute two courses from Engineering and ISCP.

Mathematics and Computer Science Option (124 credits)

Requirements for the Bachelor's degree plus:

1. Required Mathematics and Computer Science courses

MA 352	Intermediate Linear Algebra	CS 275	Data Structures
CS 191	Pascal	CS 401	Architecture of Computers
CS 241	Assembly Language Programming	CS 405	Intro. Operating Systems

2. Additional Mathematics and Computer Science courses

18 additional credits from STAT 511 Statistical Methods, MA 453 Algebra I, or any CS course numbered 300 or above.

3. Science. Choose A or B

A.

PHYS 152 Mechanics PHYS 251 Heat, Electricity, & Optics	Three credits from Biology, Chemistry, Geoscience, or Physics.

B:

PHYS 152 Mechanics PHYS 261 Heat, Electricity, & Optics	Four credits with a lab included from Biology, Chemistry, Geoscience, or Physics.

Mathematics Secondary Teaching Option (124 credits)

1. Communications

ENGL 103 Adv Freshman Comp. OR ENGL 104 English Comp. I (grade of A) and an English elective or	ENGL 104/105 English Comp. I/II OR

One of:

COM 114	Fundamentals of Speech	COM 115	Fundamentals Public Speaking

2. Science

Four lab sciences, preferably a two-course sequence in two sciences. Recommended: Biology, Chemistry, Geoscience, and Physics.

***Exception**: with advisor approval, may substitute two courses from Engineering and ISCP.*

3. Mathematics

MA 163	Integrated Calculus & Geom. I	MA 453	Algebra I
MA 164	Integrated Calculus & Geom. II	MA 560	Fundamental Concepts Geometry
MA 261	Multivariate Calculus	STAT 511	Statistical Methods
MA 262	Linear Algebra		

One of:

MA 362	Topics in Advanced Calculus	CS 414	Intro. Numerical Analysis
MA 547	Analysis for Teachers		

One of:

CS 414	Intro. Numerical Analysis	STAT 512	Applied Regression Analysis
MA 422	Differential Equations	MA 352	Intermediate Linear Algebra

One of:

CS 171	FORTRAN	CS 191	Pascal

3. Professional Education

EDFA 101	Intro. Foundations Education	EDFA 221	Society, School, & Educator
EDPS 220	Psychology of Learning		

Programs Leading to a Master of Science

Special Admission Requirements:

Strong undergraduate program in mathematics, including linear algebra, abstract algebra, advanced analysis, and differential equations.

Special Program Requirements:

1. No more than six credits of coursework with grade of C.

2. Plan of study submitted to Student Advisory Committee before the end of nine semester credits; must be approved by the Graduate School before the student registers for the semester in which the degree is to be awarded.

Master of Science in the Application of Mathematics (36 credits)

Degree Requirements

1. Seven core courses

MA 540	Analysis I	MA 554	Linear Algebra
MA 541	Analysis II	MA 525	Intro. Complex Analysis
MA 553	Intro. Abstract Algebra		

2. Statistics

Two approved courses

3. Five electives from:

Numerical Analysis
Numerical Linear Algebra
Computer Graphics
Artificial Intelligence
Probability and Statistics
Theoretical Computer Sciences
Mathematical Methods and Applications.

4. Other courses

Up to six credits may be chosen from courses in other departments—i.e., Engineering, Physics or Management.

Master of Science, Option for Teachers(33 credits)

Note: Students should check with certification officer in the Department of Education about current state certification requirements.

1. Required Mathematics courses

MA 540	Analysis I	MA 554	Linear Algebra
MA 541	Analysis II	MA 525	Intro. Complex Analysis
MA 553	Intro. Abstract Algebra		

2. Statistics: one approved course

3. Electives (5 courses)

Transfer of credit: No more than three courses accepted from other institutions, no more than 10 years prior to completion of degree program.

Department of Nursing

Gloria J. Smokvina, R.N., Ph.D., Head

Faculty:

R. Alexander
L. Bonjean
E. Bratt
L. Buechley (Emeritus)
M. Cahn
N. Cailles
E. Donaldson
M. G. Engle (Emeritus)
R. Faur
K. Fontaine
P. Gerard
R. M. Givens
R. Hiduke
D. Huffman
D. Kark
P. Kelly-Heidenthal
K. Kick
M. A. Klen (Emeritus)
E. McGuire
L. Miskovich-Riddle
K. Nix
L. Orlich (Emeritus)
H. M. Plawecki
B. Price
S. Rawl
C. Reese
C. Reid
D. Slamkowski
J. Stryczek
M. A. Thomas
J. Waggoner
B. Watts
G. Wegner

The Department of Nursing offers innovative programs to meet the professional needs of students for entry into nursing or for advanced preparation. Associate's degree students in nursing are prepared to begin their careers as entry-level registered nurses; the degree leads to eligibility for State Board examination for licensure as a registered nurse. The Bachelor's degree program prepares practicing nurses for beginning leadership positions in health care fields. The Master's level program prepares clinical nurse specialists in Adult Health or Cardiovascular nursing; electives in teaching, administration, and research are also available. The graduate program has a strong clinical emphasis and prepares graduates for diverse leadership roles in clinical practice. All programs are accredited by The National League of Nursing.

Throughout the programs, various part-time and full-time employment opportunities are available in local health care agencies, giving students work experience to relate to their university studies and supplemental income. Flexible schedules allow students to pursue programs part-time and full-time. These are university programs, with students sharing in the social and cultural aspects of college life, while developing their potential as persons, citizens, and nurses.

Admission to nursing programs is competitive, determined by the admissions committees in the department. Special requirements for admission and progression are available through the department.

Programs

Associate in Applied Science, Nursing

Bachelor of Science, Nursing

Master of Science, Nursing

Associate In Applied Science, Nursing (66 credits)

Special Admission requirements

1. Upper half quality rank of high school class to be considered for admission.

2. Indiana residents: submit SAT scores. Out-of-state residents: may submit ACT scores.

3. Comprehensive health examination

4. Malpractice insurance purchased through the university prior to first clinical course.

5. Transfer students who do not qualify based on high school records must have completed at least 12 credits of college work, including two science courses, including chemistry. Minimum 4.5/6.0 GPA recommended.

Degree requirements

1. Communications

ENGL 104 English Comp. I

2. Science And Mathematics

Science:

BIOL 203 Human Anatomy & Phys.
CHEM 119 General Chemistry
BIOL 204 Human Anatomy & Phys.
PCTX 201 Intro. Pharmacology
BIOL 220 Intro. Microbiology

3. Humanities And Social Sciences

F&N 303 Essentials of Nutrition
PSY 120 Elementary Psychology
SOC 100 Intro. Sociology

4. Nursing

NUR 148 Member of Discipline I
NUR 151 Applied Math
NUR 152 Principles of Nursing
NUR 160 Principles of Psy-Soc Nursing
NUR 161 Principles of Assessment
NUR 162 Adult-Nursing I
NUR 251 Nursing of the Child. Fam.
NUR 252 Mental-Health Nursing
NUR 261 Manager of Care
NUR 260 Children's Health
NUR 250 Member Discipline Nursing II
NUR 262 Adult Nursing II

5. Elective (3 credits)

Bachelor of Science, Nursing (120 credits)

Special Admission Requirements

1. Successful completion of Associate of Applied Science in Nursing or diploma , including courses in items 1-3 in the Associate's degree and 30 credits from item 4, or equivalent transfer credit.

2. Licensed as Registered Nurse in Indiana.

3. Minimum 4.25/6.0 GPA.

4. Comprehensive health examination prior to first clinical course

5. Malpractice insurance purchased through the university prior to first clinical course.

6. **Prenursing (PNT) Option**. Students in lower division who are not ready to begin the Nursing Program may take up to 15 credit hours to count toward the Bachelor Degree in Nursing. See advisor.

Degree Requirements

1. Nursing requirements

NUR 364 Concepts/Theories/Iss. Prof. Pract.
NUR 365 Health Assessment
NUR 366 Concepts Comm. Health
NUR 367 Concepts Family Health
NUR 374 Health Teaching & Health Promo.
NUR 375 Nursing Research
NUR 376 Community Health I
NUR 470 Community Health II
NUR 471 Critical Care Nursing
NUR 472 Preceptorship Professional Nurs.
NUR 480 Leadership and Management
NUR 481 Preceptorship Professional Nurs.

2. Electives

As approved by advisor, in Communication (3 credits), English (3 credits), Sciences (6-8 credits), Philosophy (3 credits), and Psychology or Sociology (3 credits).

3. Other electives (6)

4. Health Economics

Econ 462 Health Economics

Master of Science, Nursing (36 credits)

Students must select a clinical major in cardiovascular or adult health nursing. Electives in administration, teaching, and research available. Full-time study requires three semesters; part-time study option available

Unconditional Admission Requirements:

1. Graduation from a National League for Nursing accredited bachelor program in nursing.

2. Evidence of current registered nurse licensure.

3. Minimum 5.0/6.0. Students with lower GPA must take Graduate Record Examination Aptitude Test.

4. Personal interview with a graduate program faculty advisor.

5. Malpractice insurance purchased through the university prior to first clinical course.

6. Basic physical assessment course.

7. Introductory Statistics course.

8. 300-500 word statement explain applicant's purpose for graduate study.

9. One year of current nursing practice.

An applicant who does not meet one or more of the requirements may be considered for conditional admission status.

Special Graduation Requirements:

Minimum grade of B in all required nursing courses

1. Nursing Core courses

NUR 500	Theoretical Constr. Nursing	NUR 510	Nursing Research
NUR 504	Holistic Health Promotion	NUR 655	Sem. Prof. Nursing Practice
NUR 506	Pathophysiology	NUR 664	Principles Clinical Leadership

2. Nursing options

Choose A or B

A. Cardiovascular Nursing

NUR 512	Cardiovascular Nursing I	NUR 612	Cardiovascular Nursing II
NUR 514	Cardiovas. Nursing Practicum I	NUR 614	Cardiovas. Nursing Practicum II

B. Adult Health Nursing

NUR 518	Adult Health Nursing I	NUR 618	Adult Health Nursing II
NUR 520	Adult Health Nursing Practicum I	NUR 620	Adult Health Nursing Pract. II

3. Electives

9 credits from Nursing or other fields of study such as:

A. Teaching

NUR 660	Curriculum Development in Nur.	NUR 662	Teaching Strategies (Practicum)

B. Administration

NUR 666	Prin. Admin Health Care Unit	NUR 668	Pract. Admin. Health Care Unit

C. Research

NUR 670	Practicum Nursing Research	NUR 698	Master's Thesis

University Division

Jal J. Mistri,
Director

Staff:

O. S. Acevedo
E. D. Brickman
K. A. Galovic
L. M. Gamble
N. A. Hamilton
C. M. Servies
R. A. Stadt
K. R. Ortman Van Wie
V. L. Laurence Williams

The University Division provides opportunities for post-secondary education for students who

- need additional academic or skill preparation prior to entering an academic major at Purdue Calumet
- are undecided about a major
- are adult learners admitted as non-degree students

The University Division programs seek to provide the personal/academic proficiencies students need to succeed at the university.

The University Division provides academic advising to students undecided about a major. These students are encouraged to attend career workshops and presentations about careers. Adult learners who are non-degree-seeking students can receive assistance in selecting appropriate courses.

Developmental Program

The University Division's Developmental Program will admit those students with a combined SAT score of 500 or above and who do not meet the academic requirements for direct admission to a degree-granting program.

Students with combined SAT scores below 500 must take the University Division's achievement test.

- If the applicant scores above average, admission may be granted after an advising conference.
- If the applicant scores below average, admission will be denied, unless other significant evidence indicates potential for success in college.

Students who successfully complete the University Division's Developmental Program can be considered for transfer into an academic major based on the admission requirements of the major.

Course Requirements for Developmental Program

ENGL 018 Fundamentals of Reading
ENGL 020 Fundamentals of Writing
ENGL 104 English Composition I
Appropriate Math Courses (2)
ENGL 186 College Reading Study Skills
GNS 100 Academic Development I
GNS 101 Academic Development II

Women's Studies

Jane R. Shoup, Coordinator

The Women's Studies Program offers courses designed to increase awareness of women's issues, arts, social status, gender roles, and interpersonal relationships. Courses can be taken individually or combined into the Women's Studies minor or the Associate of Art's degree with a concentration in Women's Studies. These programs provide a special focus on gender issues as they relate to the student's major field of study

Programs

Associate of Arts, Women's Studies

Minor in Women's Studies

Associate of Arts, Women Studies (63-66 credits)

1. Communications

ENGL 103 Adv. Freshman Composition OR
ENGL 104/105 English Comp. I & II

2. Science and Mathematics (6 credits)

3. Humanities

One introductory course in each of three of the following: Philosophy, history, literature, aesthetics

4. Social Studies

One introductory course in each of three of the following: Sociology, psychology, communication, political science

5. Women's Studies Core

GS 121 Introduction to Women's Studies

6. Women's Studies electives

Four from:

COM 405	Rhetoric Women's Rights	PSY 349	Psychology of Women
ENGL 210	Gender and Style Literature	SOC 350	Social Psych. of Marriage
ENGL 320	By and About Women	ENGL 232A	Mothers & Daughters Lit.
HIST 365	Women in America	ENGL 232B	International Women's Lit.
PSY 344	Human Sexuality	SOC 450	Sex Roles Modern Society

7. Other electives (18 credits)

Minor in Women's Studies (15 credits)

1. Women's Studies Core

GS 121 Introduction to Women's Studies

2. Women's Studies electives.

Four from:

COM 405	Rhetoric Women's Rights	PSY 349	Psychology of Women
ENGL 210	Gender and Style Literature	SOC 350	Social Psych. of Marriage
ENGL 320	By and About Women	ENGL 232A	Mothers & Daughters Lit.
HIST 365	Women in America	ENGL 232B	International Women's Lit.
PSY 344	Human Sexuality	SOC 450	Sex Roles Modern Society

Associate of Arts in Liberal Arts and Sciences

The Associate of Arts degree is offered through the School of Liberal Arts and Sciences. The program includes general education requirements to insure that every student will acquire skill in written communication and has had exposure to the social sciences and humanities. A concentration in a subject area is also required to insure that students have a concentrated experience in one area of knowledge.

Admission to the Associate of Arts degree program is separate from admission to the Bachelor of Arts programs. Transferring from the Associate to the Bachelor's degree programs requires permission of the Dean of the School of Liberal Arts and Sciences.

Students who transfer into the Associate of Arts program must complete at least twenty credits after admission before receiving the Associate degree.

Associate of Arts (63 credits)

1. Communications

ENGL 104 & 105 English Composition I & II

2. Science and Mathematics (6 credits)

3. Humanities and Social Science

Humanities. One introductory course from each: aesthetics, history, literature, and philosophy

Social Science. One introductory course from each: communication, political science, psychology, and sociology

4. Concentration

15 credits in one of the following areas:

Foreign Languages
Foundations Of Teaching
History
Literature
Philosophy
Political Science
Popular Culture
Professional Speech Communication Skills
Recreational Leadership
Sociology
Technical/business Writing
Women's Studies

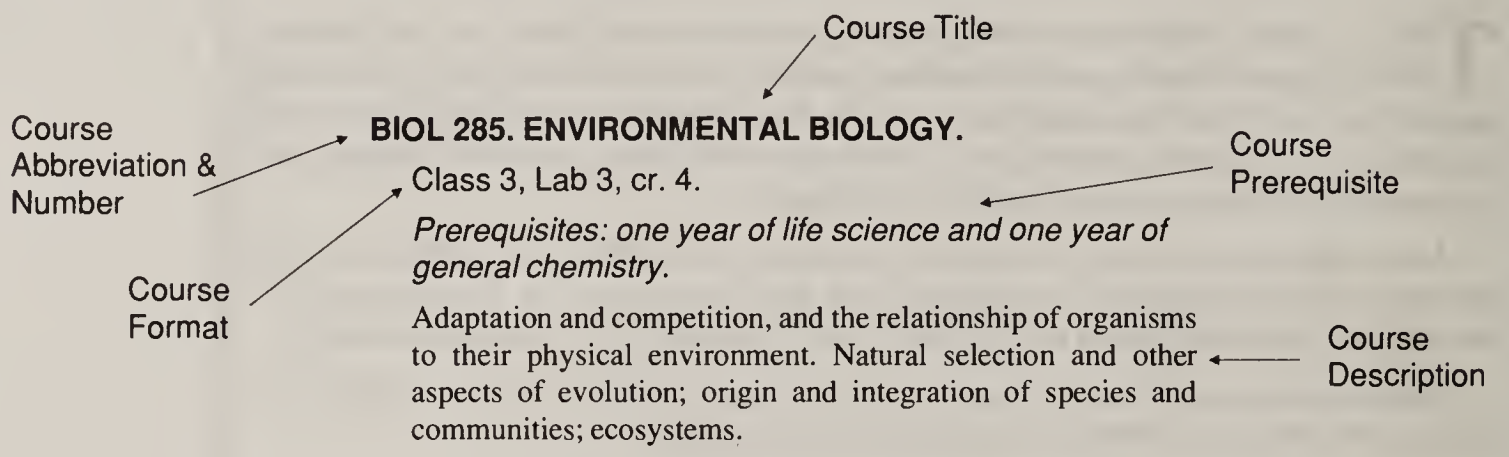
5. Electives

18 credits, of which 12 may be from schools of the university other than Liberal Arts and Sciences

Course Listing

In this section, each course offered at Purdue University Calumet is listed in alphabetic order by course abbreviation. Courses numbered 1–499 are primarily for undergraduate students. Courses numbered 500-599 are for undergraduates (usually juniors and seniors) and graduate students. Courses numbered 600 and above are for graduate students only.

Each course entry should be interpreted as follows: **First** is the abbreviation of the course, then its number and title. **Second** is the course format, which shows the number of hours each week the class meets, lab hours if appropriate, and credit hours for the course. **Third** is a list of prerequisites, if necessary. **Fourth** is the description of the course.


Course Title
Course Abbreviation & Number
BIOL 285. ENVIRONMENTAL BIOLOGY.
Class 3, Lab 3, cr. 4.
Course Prerequisite
Prerequisites: one year of life science and one year of general chemistry.
Course Format
Adaptation and competition, and the relationship of organisms to their physical environment. Natural selection and other aspects of evolution; origin and integration of species and communities; ecosystems.
Course Description

Course Abbreviations

A&D Art and Design
AGRY Agronomy
ANSC Animal Science
ANTH Anthropology
ARET Architectural Technology
AUS Audiology and Speech Sciences
BHS Behavioral Sciences
BIOL Biological Science
CDFS Child Development and Family Studies
CE Civil Engineering
CET Civil Engineering Technology
CFS Consumer and Family Sciences
CHM Chemistry
CHT Chemical Technology
CIS Computer Information Services
CNT Construction Technology
COM Communication
CS Computer Sciences
ECON Economics
EDCI Education, Curriculum, and Instruction
EDFA Education, Foundations, and Administration
EDPS Education and Professional Studies
EE Electrical Engineering
EET Electrical Engineering Technology
ENGL English
ENGR Engineering
FLL Foreign Languages and Literatures
F&N Foods and Nutrition
FR French
GEOS Geosciences
GER German
GNS General Studies
GS General Studies (School of Liberal Arts and Sciences)
HIST History
HORT Horticulture
HPER Health, Physical Education and Recreation
HSCI Health Sciences
IDIS Interdisciplinary Studies
IE Industrial Engineering
IET Industrial Engineering Technology
MA Mathematics
ME Mechanical Engineering
MET Mechanical Engineering Technology
MFET Manufacturing Engineering Technology
MGMT Management
MSE Materials Engineering
MUS Music History and Theory
NUCL Nuclear Engineering
NUR Nursing
OBHR Organizational Behavior
PCTX Pharmacology
PHIL Philosophy
PHYS Physics
POL Political Science
PSY Psychology
RHI Restaurant,, Hotel, and Institutional Management
SCI Science
SOC Sociology
SPAN Spanish
SPV Supervision
STAT Statistics
SWRK Social Work
THTR Theater
WOST Women's Studies

ART AND DESIGN

A&D 105. DESIGN I.
Class 1, Studio 5, cr. 3.
Two-dimensional design; an introduction to the elements of design with experiments in the creation of forms and shapes and their organization in a two-dimensional field.

A&D 106. DESIGN II.
Class 1, Studio 5, cr. 3.
Three-dimensional design; an introduction to the organization of forms and volumes in space with experiments in the use of various materials and simple tools.

A&D 113. BASIC DRAWING.
Class 1, Studio 5, cr. 3.
An introduction to drawing and sketching as a means of communication of ideas.

A&D 114. DRAWING II.
Class 1, Studio 5, cr. 3.
Prerequisite: A&D 113 or consent of instructor.
Continuation of A&D 113; emphasis is given to the exploration of a variety of media and the structuring of pictorial space.

A&D 200. DRAWING AND PAINTING I.
Class 1, Studio 5, cr. 3.
Course designed to stimulate a beginning understanding of the philosophies, the use of materials, and the practices leading to the art of painting.

A&D 202. INTRODUCTION TO ART EDUCATION.
Sem. 1 and 2.
Class 3, cr. 3.
Lectures, readings, and discussions covering the history, theory, and professional literature of art education. (Required prior to professional semester.)

A&D 203. ART ACTIVITIES FOR ELEMENTARY TEACHERS.
Class 1, Lab. 2, cr. 2.
An undergraduate course designed to assist the student in gaining basic skills in art media and method as a beginning classroom teacher. This exposure to the basic art program should provide a stimulating, enrichment art program for the classroom.

A&D 207. PHOTOGRAPHY I.
Class 1, Studio 5, cr. 3.
Prerequisite: A&D 106 and 114, or consent of instructor.
Introduction to the basic visual and technical qualities of photography.

A&D 213. LIFE DRAWING I.
Class 1, Studio 5, Cr. 3.
Prerequisite: A&D 113 and 114 or consent of instructor.
Introduction to drawing the human figure with emphasis upon structure and gesture.

A&D 214. LIFE DRAWING II.
Class 1, Studio 5, cr. 3.
Prerequisite: A&D 113 and 114 or consent of instructor.
Continuation of A&D 213; emphasis is given to organizing the figure in pictorial space.

A&D 225. FABRIC PRINTMAKING I.
Class 1, Studio 5, cr. 5.
Basic techniques of fabric decoration including Batik, tie and die, and Serigraphy (silk screen).

A&D 242. CERAMICS I.
Class 1, Studio 5, cr. 3.
(formerly A&D 369.)
Prerequisite: A&D 106 and 114, or consent of instructor.
Beginning problems in ceramics.

A&D 255. ART APPRECIATION.
Class 3, cr. 3.
Understanding and appreciation of the origins and growth of art. A trip to a major museum is included in the course.

A&D 259. PAINTING II.
Class 1, Studio 5, cr. 3.
Prerequisite: A&D 200 or consent of instructor.
Exploration in the creative use of clay and metal media-pottery, jewelry, metal enameling.

A&D 265. RELIEF PRINTMAKING.
Class 1, Studio 5, cr. 3.
Prerequisite: A&D 105 and 113, or consent of instructor.
An introduction to the techniques and creative use of woodcut, linecut, wood engraving, and serigraphy.

A&D 361. JEWELRY DESIGN.
Class 1, Studio 5, cr. 3.
Prerequisite: A&D 106, 114 or consent of instructor.
Problems of creation of original designs in jewelry.

A&D 365. PAINTING III.
Class 1, Studio 5, cr. 3.
Prerequisite: A&D 259 or consent of instructor.
A studio course concentrating on the introduction of attitudes designed to help the individual student to a greater consciousness of his personal creative needs and to help him develop personal means of expression with the art of painting.

A&D 375. SCULPTURE.
Class 1, Studio 5, cr. 3.
Prerequisite: A&D 106, 114 or consent of instructor.
An introduction to basic techniques of modeling and carving in relief and in the round.

A&D 399. ART TOUR.
Lab. 4, cr. 2.
Prerequisite: consent of instructor. (May be taken concurrently with MUS 399 and/or THTR 399. May be repeated for credit if sites visited are different.)
A course designed to expose students to art works and historical sites of interest to art outside the immediate area. The art world will be observed in relation to the worlds of music and theater.

A&D 501. ART EDUCATION: ARTS AND CRAFTS.
Class 1, Lab. 5, cr. 3.
Admission by consent of instructor.
A studio course which incorporates lecture on art-programming and methods of instruction appropriate to all school levels. Students will complete a variety of individual art projects.

A&D 590. SPECIAL ART PROBLEMS.
Cr. 1-6.
Prerequisite: consent of the instructor and the head of the department.
Individual problems in art history, appreciation, design, crafts, drawing, and painting. Credit dependent upon amount of work done.

A&D 601. SEMINAR IN ART EDUCATION.
Class 3, cr. 3.
Critical analysis of professional literature and research in art education.

AGRONOMY

AGRY 429. GENETICS LABORATORY.
Lab. 3, cr. 1.
Prerequisite or corequisite: AGRY 430.
Experiments in microorganisms, plants, and animals (including human) genetics, emphasizing molecular approaches. Exercises also include molecular cloning and hybridization.

AGRY 430. GENETICS.
Class 3, cr. 3.
Prerequisite: BIOL 108 or 109, or equivalent.
The transmission of heritable traits, probability; genotypic-environmental interactions; chromosomal aberrations; gene mutations genes in populations; the structure and function of nucleic acids; gene regulation; DNA technology.

ANIMAL SCIENCE

ANSC 221. INTRODUCTORY ANIMAL NUTRITION.
Class 3, cr. 3.
Prerequisite: CHM 111 or 112, or equivalent.
A study of the digestive processes, composition of feedstuffs, nutritional requirements, and formulation of practical rations for farm animals.

ANTHROPLOGY

ANTH 105. AN INTRODUCTION TO CULTURAL ANTHROPOLOGY.
Class 3, cr. 3.
An introduction to the science of man and his works. Emphasis on the nature of culture and culture change; relationship of culture and personality. Attention given to the variations with the "Universal" institutions of man: language, technology, the family, systems of social control, economics, warfare, religion, art, and values. Processes of invention, diffusion and acculturation; theoretical interpretations of the direction and process of cultural development.

ANTH 204. AN INTRODUCTION TO HUMAN EVOLUTION.
Class 3, cr. 3.
An outline of human evolution interrelating man's changing physical characteristics with his evolving social and cultural adaptations. Man's relationships to the other primates, both physically and behaviorally are explored within an evolutionary framework. The archaeological record is used to document the history of man during the last five million years. Transformations of human life initiated by the domestication of plants and animals are outlined using archaeological data from the Near East and Mexico.

ANTH 341. CULTURE AND PERSONALITY.
Class 3, cr. 3.
Prerequisite: three hours of anthropology, sociology, child development, or psychology, or equivalent.
A cross-cultural survey stressing differing basic personality types and the process by which adult personality is acquired. Case studies of selected non-western cultures will be used to provide comparative perspective.

ANTH 414. INTRODUCTION LANGUAGE AND CULTURE.
Class 3, cr. 3.
Prerequisite: ANTH 105 or equivalent.
This course introduces undergraduate students to the anthropological view of language. Communication systems of other animals will be discussed to highlight the importance of language in the development of culture. Various theories of language and the diversity of language will be investigated. The anthropologist's view of language structure, linguistic change, and writing systems will be presented. There will be a strong emphasis on the relation of language to other aspects of culture. Non-Indo-European languages will be compared to American English throughout the course.

ANTH 590. INDIVIDUAL RESEARCH PROBLEMS.
Cr. 1-3.
Prerequisite: consent of instructor. (May be repeated for credit.)
Individual research or reading in an area of anthropology under an anthropologist staff member. Does not include thesis work.

ARCHITECTURAL ENGINEERING TECHNOLOGY

ARET 117. CONSTRUCTION DRAFTING AND CAD.
Class 1, Lab. 5, cr. 3.
Introduction to drafting fundamentals with emphasis on architectural and civil engineering topics. Develop basic drafting skills, using orthographic projections, auxiliary views and perspectives. Students will be introduced to the fundamental of CAD.

ARET 120. ARCHITECTURAL SKETCHING.
Class 1, Lab. 5, cr. 3.
The exploration of basic freehand drawing skills through the study of line, form, values, composition and color with an emphasis on architectural and construction subjects. Experimentation with various media will be included in order to develop an understanding of representational drawing.

ARET 150. ARCHITECTURAL CONSTRUCTION I.
Lab. 9, cr. 3.
(Evening Divisions: Lab. 6, cr 3. with outside assignments required.)
Prerequisite: ARET 117 or ENGR 114.
A study of wood frame construction through a semester project requiring planning, preliminary and working drawings, and a model of the framing system. Field trips may be included.

ARET 170. MATERIALS & SYSTEMS OF CONSTRUCTION.
Class 3, cr. 3.
An introduction to the nature of the construction industry and a survey of the most commonly used construction materials with special emphasis on their properties, characteristics limitations and applications into different construction elements and systems such as foundations, columns, trusses, arches, frames, etc. Guest speakers will discuss the nature and opportunities within the construction industry.

ARET 222. ARCHITECTURAL CONSTRUCTION II.
Lab. 9, cr. 3.
(Evening Divisions: Lab. 6, cr. 3, with outside assignments required.)
Prerequisite: ARET 150.
Preparation of preliminary and working drawings for an intermediate-sized commercial or institutional building.

ARET 284. MECHANICAL EQUIPMENT OF BUILDINGS.
Class 3, cr. 3.
A study of plumbing, heating and air conditioning for residential and commercial buildings. Water supply and drainage systems, heat loss and heat gain, heating systems, and air-conditioning systems.

ARET 285. ELECTRICITY FOR BUILDINGS.
Class 3, cr. 3.
A survey of electrical and lighting requirements for residential and

commercial buildings. Lighting fundamentals and design, electric circuits, power requirements, and wiring layout. Field trips to appropriate locations are part of the course.

ARET 299. ARCHITECTURAL ENGINEERING TECHNOLOGY.
Cr. 1-4.
Hours and subject matter to be arranged with staff. Course may be repeated up to 9 hours.

ARET 360. COMMUNITY PLANNING I.
Class 2, Lab. 3, cr. 3.
A study of planning methods, legislation, and agencies, Emphasis on collection of data about an existing community and the preparation of land-use maps from that data.

ARET 362. COMMUNITY PLANNING II.
Class 1, Lab. 6, cr. 3.
Prerequisite: ARET 360.
Application of planning methods to the development of a new community or the redevelopment of an existing community.

ARET 376. SPECIFICATIONS AND CONTRACT DOCUMENTS.
Class 3, cr. 3.
Analyze the content and organization of specifications and how they relate to working drawings during construction. Study of the various types of contract documents used for construction.

ARET 425. SOLAR CONSTRUCTION.
Class 3, cr. 3.
A study of building orientation, energy conservation principles, insulation, insolation and a survey of passive and active solar energy systems. An investigation of building materials and systems of construction as they relate to passive solar energy systems.

ARET 435. BUILDING REHABILITATION.
Class 3, cr. 3.
As a construction elective course in the program, this course is designed to provide upper level construction technology students an opportunity to study all aspects of rehabilitating existing structures with primary emphasis on architectural, structural, mechanical, electrical, historic and financial considerations.

ARET 499. ARCHITECTURAL TECHNOLOGY.
Cr. 1-4.
Hours, subject matter and credit to be arranged with staff. Course may be repeated for credit up to 9 hours.

AUDIOLOGY & SPEECH SCIENCES

AUS 115. INTRODUCTION TO COMMUNICATIVE DISORDERS.
Class 3, cr. 3.
Nature, symptoms, and causes of communication disorders and the principal methods used for remediation.

BEHAVIORAL SCIENCES

BHS 112. INTRODUCTION TO EARLY CHILDHOOD EDUCATIONS.
Class 3, cr. 3.
Corequisite: PSY 361.
A survey of early childhood education which includes childcare, private kindergarten, and other programs for young children. Includes a comparative study of theories of early childhood in existing program models; curriculum planning and teaching strategies; and how to organize a good program, including emphasis on the different needs of each child and parent involvement.

BHS 113. APPLIED DEVELOPMENTAL CHILD CARE.
Class 3, cr. 3.
Prerequisites: PSY 361 and BHS 112.
An advanced study in promoting positive functioning of children and adults in a group environment and in building positive self-concept and individual strength in young children.

BHS 200. TECHNIQUES OF HUMAN ASSESSMENT.
Class 3, cr. 3.
Prerequisite: PSY 361.
An advanced study of behavioral development of the young child. Assessment techniques of the child care settings and of children, observation methods, and an in-depth case study of an individual child.

BHS 201. STATISTICAL METHODS FOR THE BEHAVIORAL SCIENCES.
Class 3, cr. 3.
Prerequisite: Working knowledge of high school algebra. (Not open to students with credit in PSY 500.)
An introduction to descriptive and inferential statistics as applied to the behavioral sciences.

BHS 212. EARLY CHILDHOOD CURRICULUM I.
Class 2, Lab. 3, cr. 3.
Prerequisites: PSY 361 and BHS 112.
Curriculum for childcare, private kindergarten and other early childhood programs. Knowledge, understanding and teaching techniques for language arts (includes children's literature, flannel board, storytelling, fingerplays); music (includes songs and instruments); movement; art (explores a variety of mediums, creativity and developmental levels in children's drawing); bulletin boards, cooking; mud, sand and water; blocks. Includes lesson planning, unit planning, assessment of child, direct participation in a private kindergarten or child care program, and home-school communication. Specific emphasis is placed on integration of cognitive development, social-emotional development and physical development.

BHS 213. EARLY CHILDHOOD CURRICULUM II.
Class 2, Lab. 3, cr. 3.
Prerequisites: BHS 112, BHS 212, and PSY 361 or consent of instructor.
Curriculum for childcare, private kindergarten and other early childhood programs. Knowledge, understanding and teaching techniques for mathematics, social studies, science and physical activities. Includes puppets, prop boxes, table toys, woodworking. Includes lesson planning, unit planning, assessment of child, direct participation in a private kindergarten or child care program and home-school communication. Specific emphasis is placed on integration of cognitive development, social-emotional development and physical development.

BHS 222. PRACTICUM IN EARLY CHILDHOOD I.
Cr. 3.
Prerequisite: BHS 212 and consent of instructor.
Directed in-service training in care settings.

BHS 223. PRACTICUM IN EARLY CHILDHOOD II.
Cr. 3.
Prerequisites: BHS 222, BHS 213, and consent of instructor.

Directed in-service training in care settings.

BHS 251. CHILD CARE ADMINISTRATION.
Class 3, Lab. 0, cr. 3.
Prerequisites: BHS 112, BHS 113, PSY 361 or consent of instructor.
Principles and practices regarding administrative and operational decisions, philosophical foundations, and state regulations of child care centers.

BHS 260. NUTRITION FOR HUMAN DEVELOPMENT.
Class 3, Lab. 1, cr. 3.
Basic nutrition and its application in meeting nutritional needs as they change over the life span. Special considerations are given to food selection, legislation, and community nutrition educational programs.

BHS 290. TOPICS FOR STUDY.
Cr. 1-3.
Variable credit, variable title course for group or individual study.

BIOLOGICAL SCIENCE

BIOL 101. INTRODUCTORY BIOLOGY.
Class 3, Lab. 3, cr. 4.
Molecular and cellular biology, basic chemistry, cell structure and physiology, cell division, genetics and development. Laboratories include illustration of basic concepts with emphasis on data collection and interpretation.

BIOL 102. INTRODUCTORY BIOLOGY.
Class 3, Lab. 3, cr. 4.
Biology of organisms and populations. Morphology, physiology, and systematics of organisms, evolution, ecology and behavioral biology. Laboratories include survey of representative taxa.

BIOL 105. LATIN AND GREEK TERMINOLOGY FOR THE BIOLOGICAL SCIENCES.
Class 3, cr. 2.
A study of the Latin and Greek roots of words used in the biological and medical sciences. Students will be introduced to the principles of syllabification, root words, common prefixes and suffixes. This course may not be used by Science and Nursing students to fulfill a science requirement.

BIOL 108. BIOLOGY OF PLANTS.
Class 3, Lab. 3, cr. 4.
Introduction to the growth, functioning, structures, heredity, diversity of plants, and their interactions with the environment.

BIOL 109. BIOLOGY OF ANIMALS.
Class 3, Lab. 3, cr. 4.
Introduction to the structure, functioning, heredity, development, classification, and evolution of animals, and their interactions with the environment.

BIOL 203. HUMAN ANATOMY AND PHYSIOLOGY.
Class 2, Lab. 2, cr. 3.
Introduction to human biology with emphasis on anatomy and physiology.

BIOL 204. HUMAN ANATOMY AND PHYSIOLOGY.
Class 2, Lab. 2, cr. 3.
Prerequisite: BIOL 203
Continuation of BIOL 203.

BIOL 207. PLANT MORPHOLOGY.
Class 2, Lab. 4, cr. 3.
Prerequisite: two semesters of biological science.
Survey of the plant kingdom with the study of structure as related to function, reproductive process, classification, and phylogenetic relationships of principal plant groups.

BIOL 208. VERTEBRATE HISTOLOGY AND ORGANOLOGY.
Class 2, Lab. 4, cr. 3.
Prerequisite: two semesters of biological science.
Study of fundamental aspects of tissue and organ structure and function in vertebrates.

BIOL 211. THE SOCIAL IMPACT OF THE BIOLOGICAL SCIENCES.
Class 2, Lab. 2, cr. 3.
An introduction to basic concepts, experimentation and information found within the biological sciences. Emphasis is placed upon the role of biology within the social framework. Relationships between this discipline and common social problems are explored.

BIOL 212. THE SOCIAL IMPACT OF THE BIOLOGICAL SCIENCES.
Class 2, Lab. 2, cr. 3.
A continuation of BIOL 211. It is recommended but not required that this course be preceded by BIOL 211.

BIOL 220. INTRODUCTION TO MICROBIOLOGY.
Class 3, Lab. 2, cr. 3.
Prerequisites: one semester of general chemistry and one year of a life science.
The isolation, growth, structure, functioning, heredity, identification, classification, and ecology of microorganisms, their role in nature and significance to man.

BIOL 221. INTRODUCTION TO MICROBIOLOGY.
Class 3, Lab. 3, cr. 4.
Prerequisites: one semester of general chemistry and one year of a life science.
The isolation, growth, structure, functioning, heredity, identification, classification, and ecology of microorganisms, their role in nature and significance to man.

BIOL 285. ENVIRONMENTAL BIOLOGY.
Class 3, Lab. 3, cr. 4.
Prerequisites: one year of life science and one year of general chemistry.
Adaptation and competition, and the relationship of organisms to their physical environment. Natural selection and other aspects of evolution; origin and integration of species and communities; ecosystems.

BIOL 295. SPECIAL ASSIGNMENTS.
Cr 1-4. (May be repeated for credit.)
Consent of the instructor required.
Reading, discussions, written reports or laboratory work selected for enrichment in special areas of the biological sciences.

BIOL 320. INTRODUCTORY CELL BIOLOGY.
Class 3, cr. 3.
Prerequisite: one semester of life science and one semester of organic chemistry; corequisite: BIOL 321, unless by consent of instructor.
Structure and function of prokaryotic and eukaryotic cells, emphasizing biochemistry and physiology.

BIOL 321. LABORATORY IN INTRODUCTORY CELL BIOLOGY.
Lab. 4, cr. 2.
Prerequisite or corequisite: BIOL 320.
Experiments with prokaryotic and eukaryotic cells with emphasis on biochemistry.

BIOL 340. HUMAN PHYSIOLOGY.
Class 3, Lab. 4, cr. 5.
Prerequisites: CHM 119 and BIOL 203-204 (or equivalents); or BIOL

101-102 (or equivalent) and CHM 111-112 (or equivalent); or consent of instructor.

A study of human physiology for students entering health oriented fields. The following systems will be examined; nervous, muscular, circulatory, respiratory, urinary, digestive, and endocrine. Emphasis on the relationship of function to structure at various levels of organization. Attention will be drawn to homeostatic mechanisms and intersystem interactions.

BIOL 350. INTRODUCTION TO PLANT PHYSIOLOGY.

Class 3, Lab. 3, cr. 4.

Prerequisites: BIOL 108 or one year of life science, one semester of organic chemistry.

Fundamentals of plant physiology with emphasis on applications to plant development.

BIOL 357. INTRODUCTORY ANIMAL PHYSIOLOGY.

Class 3, Lab. 3, cr. 4.

Prerequisites: One year of life science and CHM 116 or equivalent.

A system analysis of animal physiology. With emphasis on mammals, the operation of systems such as respiratory, cardiovascular, neuromuscular, and endocrine will be considered. Interactions between components of individual systems as well as intersystem interaction is discussed.

BIOL 429. GENETICS LABORATORY.

Lab. 3, cr. 1.

Prerequisite or corequisite: BIOL 430.

Experiments in microorganisms, plants, and animals (including human) genetics, emphasizing molecular approaches. Exercises also include molecular cloning and hybridization.

BIOL 430. GENETICS.

Class 3, cr. 3.

Prerequisite: one year of life science.

The transmission of heritable traits, probability; genotypic-environmental interactions; chromosomal aberrations; gene mutations; genes in populations; the structure and function of nucleic acids; gene regulation, DNA technology.

BIOL 440. HERPETOLOGY.

Class 2, Lab. 2, cr. 3.

Prerequisites: one year of life science and one year of general chemistry. Recommended: BIOL 285, Environmental Biology.

The evolution, paleontology, taxonomy, morphology, physiology, ecology, and geographic distribution of amphibians and reptiles. Museum techniques, biosystematics, preservation, and caring for specimens is included. Field work emphasizes collection and identification of Indiana species.

BIOL 482. BIOLOGICAL CONSERVATION.

Class 3, Lab. 1, cr. 3.

Prerequisite: one previous BIOL, CHM, or PHYS course or consent of instructor.

General principles of conservation with emphasis on the wise use of the total environment. Study of threats to species, including man, and the threats to natural communities. The laboratory will consist of a total of 15 hours of projects and field trips. Dates and hours of these activities will be arranged at the beginning of each offering of this course. This course is recommended for education majors and as a science elective for all students except chemistry, physics, biology, and mathematics majors.

BIOL 495. SPECIAL ASSIGNMENTS.

Cr. 1-4.

(May be repeated for credit.)

Consent of the instructor required.

Reading, discussions, written reports or laboratory work selected for enrichment in special areas of the biological sciences.

BIOL 505. BIOLOGY OF INVERTEBRATE ANIMALS.

Class 2, Lab. 4, cr. 4.

Prerequisites: BIOL 109 or equivalent.

A survey of the invertebrate animals, their morphology, physiology, ecology, and phylogeny.

BIOL 507. MOLECULAR BIOLOGY.

Class 3, cr. 3.

Prerequisites: BIOL 320-321, or BIOL 429-430, or CHM 533 or equivalent.

Molecular aspects of structure and function of nucleic acids and proteins, including recombinant DNA research. Prokaryotic and eukaryotic molecular biology are given equal weight.

BIOL 508. RECOMBINANT DNA TECHNIQUES.

Class 1, Lab. 5, cr. 3.

Prerequisites: BIOL 320-321, or BIOL 429-430, or CHM 533 or equivalent.

Basic principles of genetic engineering, gene cloning with various vectors. Techniques include isolation of DNA, use of restriction endonucleases, separation of DNA fragments, transformation of *E. coli* with recombinant DNA, detection of DNA sequences in Southern blot hybridization, mRNA isolation, cDNA library construction, and DNA sequencing.

BIOL 510. MICROTECHNIQUE.

Class 2, Lab. 4, cr. 4.

Prerequisite: one year of biology and one year of chemistry.

Theory and technique of light microscopy, preparation of biological material for anatomical and cytological study, including cytochemistry and photomicrography.

BIOL 522. CYTOLOGY.

Class 2, cr. 2.

Prerequisites: One year of life science, one semester of organic chemistry.

The molecular basis for structure in animals and plant cells. Organization and function of subcellular organelles. Energy transduction. Cell division and organelle development.

BIOL 523. LABORATORY IN CYTOLOGY.

Lab. 4, cr. 2.

Prerequisite or corequisite: BIOL 522.

Isolation of cellular organelles and light and electron microscope studies of cell structure.

BIOL 524. MICROBIOLOGY.

Class 3, cr. 3. or Class 2, Lab. 4, cr. 4.

Prerequisites: BIOL 220 or 221, or consent of instructor.

Emphasis on bacteria and viruses and intensive study of their isolation, composition, structure, reproduction, and death; identification, classification, ecology, role in nature, and significance to man.

BIOL 525. NEUROBIOLOGY.

Class 2, Lab. 3, cr. 3.

Physiology of nerve cells. Functions of peripheral and central nervous system of vertebrates. Neural correlates of behavior in invertebrate and vertebrate nervous systems.

BIOL 527. GENERAL MYCOLOGY.

Class 2, Lab. 3, cr. 3.

Prerequisite: one semester of microbiology.

Survey of fungi with emphasis on form, structure, genetics, growth, nutrition, and classification.

BIOL 533. MEDICAL MICROBIOLOGY.
Class 3, cr. 3.
Prerequisite: BIOL 220 or 221.
Properties of microorganisms associated with infectious diseases. Interactions of microorganisms and their hosts. Principles of immunology and serology.

BIOL 534. LABORATORY IN MEDICAL MICROBIOLOGY.
Lab. 4, cr. 2.
Prerequisite or Corequisite: BIOL 533.

BIOL 541. GENETIC BIOLOGY.
Class 3, Lab. 2, cr. 4.
Prerequisites: BIOL 320, 321, and one year of organic chemistry, or consent of instructor.
Quantitative, molecular, and physiological genetics, including a review of classical principles.

BIOL 551. PLANT PHYSIOLOGY.
Class 3, cr. 3.
Prerequisites: BIOL 320, 321.
Photosynthesis, mineral nutrition, nitrogen metabolism, water relations, respiration, and growth. Emphasis on quantitative aspects and current literature.

BIOL 552. LABORATORY IN PLANT PHYSIOLOGY.
Lab. 4, cr. 2.
Prerequisite or corequisite: BIOL 551, unless by consent of instructor.

BIOL 560. PLANT STRUCTURE.
Class 4, cr. 4.
Prerequisite: BIOL 108 or equivalent or one year of life science.
All major plant groups are studied in an intensive investigation of structure as related to function and classification. Students learn and apply techniques of tissue preparation for microscopic observation and cytochemical analysis.

BIOL 561. IMMUNOLOGY.
Class 3, cr. 3.
Prerequisite: BIOL 220, 221 or equivalent.
Introduction to the basic principles of immunology and serology in the molecular, cellular and organismal level.

BIOL 566. DEVELOPMENTAL BIOLOGY.
Class 3, Lab. 3, cr. 4.
Prerequisite: one year of life science.
Principles of development of plants and animals; the formation of organ systems.

BIOL 574. PLANT TAXONOMY.
Class 2, Lab. 4, cr. 4.
Prerequisite: BIOL 108 or equivalent and consent of instructor.
The principles and techniques of identification of vascular plants, consideration of apeciation, evolutionary mechanisms, and phylogenetic systems. Laboratory and field work pertaining to the principles and techniques of plant taxonomy.

BIOL 580. EVOLUTION.
Class 3, cr. 3.
Prerequisite: one year of life science.
A study of evolution as a basic concept of the biological sciences; an examination of current methods of experimentation within the area, as well as evidences for and possible mechanisms of evolutionary change.

BIOL 587. BIOGEOGRAPHY.
Class 3, cr. 3.
Prerequisites: BIOL 285, BIOL 580, or consent of instructor.
An introduction to the principles of biogeography. Distribution patterns, the role of history, the interactions of genetics and ecology in development of the species range, the species equilibrium theory, and the evolutionary biogeography of communities and regional biotas.

BIOL 588. PLANT ECOLOGY.
Class 2, cr. 2.
Prerequisite: BIOL 108 or equivalent.
The physico-chemical and biotic environment affecting plants in nature; the dynamics of plant communities; ecological methods. Applications to agronomy, forestry, wildlife management, outdoor recreation, and other land-use interests.

BIOL 589. LABORATORY IN PLANT ECOLOGY.
Lab. 4, cr. 2.
Prerequisite or corequisite: BIOL 588.
Class field trips and laboratory exercises.

BIOL 591. FIELD ECOLOGY.
Class 2, Lab. 4, cr. 4.
Prerequisite: BIOL 285.
A study of interactions which influence distribution and abundance or organisms and the theory which attempts to account for observed patterns in populations, communities, and ecosystems; adaptive strategies of organisms to interactions with other organisms and their environments. Emphasis on field studies and techniques and methods of sampling in aquatic and terrestrial communities.

BIOL 593. ETHOLOGY.
Class 3, Lab. 3, cr. 4.
Animal behavior is analyzed in natural and experimental situations. Emphasis is on the observation of wild and domesticated animals. The effect of early experience, motivation, physiological mechanisms, adaptiveness and the evolution of behavior are considered.

BIOL 595. SPECIAL ASSIGNMENTS.
Cr 1-4.
(May be repeated for credit.)
Special work, such as directed reading, independent study or research, supervised library, laboratory, or field work, or presentation of material not available in the formal courses of the department. The field in which work is offered will be indicated in the student's record. Required for M.S. candidates in the non-thesis option.

BIOL 698. RESEARCH M.S. THESIS.

CHILD DEVELOPMENT & FAMILY STUDIES

CDFS 590. FAMILY THERAPY SKILLS.
Prerequisite: Admission by consent of instructor.
Training in use of basic family therapy skills. Procedures are applied in practice groups and analogue situations.

CDFS 601. ADVANCED CHILD DEVELOPMENT.
Prerequisite: Advanced course work in child development and family studies or psychology.
An advanced survey of selected dimensions of child development from birth through middle and later childhood. Particular attention is given to the roles of parents and teachers in influencing child personal, social, emotional, and intellectual behavior and development. A supervised practicum with children in laboratory settings accompanies the course.

CDFS 602. ADVANCED FAMILY STUDIES.
Prerequisite: 12 hours of social sciences, including six hours of ad-

vanced undergraduate courses preparing students for the study of the family, or consent of instructor.
Integrative and comprehensive assessment of both classic and recent contributions in the field of family studies. Topics include both classic and recent contributions in the field of family studies. Other topics include major theory and research, historical, current, and future critical issues in family studies.

CDFS 603. THEORIES OF FAMILY THERAPY.
Prerequisite: At least one 600-level course in child development and family studies and consent of instructor.
An examination of the history of family therapy, major family therapy theorists, and therapy treatment modalities.

CDFS 615. RESEARCH METHODS IN CHILD AND FAMILY STUDY.
The basic research methods employed in the study of children and of families are examined. Students are afforded supervised practice in the application of selected research strategies and methodologies.

CDFS 663. STRUCTURAL AND STRATEGIC FAMILY THERAPIES.
Prerequisite: CDFS 603 or consent of instructor.
Investigation of theory, research, and practice of structural and strategic family therapies. Readings will include a wide range of the original works of major theorists such as Erickson, Minuchin, Haley, Watzlawick, and Palazzoli.

CDFS 664. BEHAVIORAL, EXPERIENTIAL, AND COMMUNICATIONAL FAMILY THERAPIES.
Prerequisite: CDFS 603 or consent of instructor.
Investigation of theory, research, and practice of behavioral, experiential, and communicational family therapies. Readings will include a wide range of original works of major theorists.

CDFS 665. TRANSGENERATIONAL AND SPECIALIZED FAMILY THERAPIES.
Prerequisite: CDFS 603 or consent of instructor.
Investigation of theory, research, and practice of transgenerational and specialized family therapies. Readings will include a wide range of original works of the major theorists.

CDFS 669. PRACTICUM IN FAMILY THERAPY.
Prerequisite: CDFS 663.
Admission by consent of instructor.
(May be repeated for credit.)
Supervised counseling experience in family therapy.

CDFS 670. HUMAN SEXUALITY.
Admission by consent of instructor.
Study of the broad scope of human sexual development and expression. Particular attention devoted to literature on sexual behavior over the life cycle, alternate forms of sexual expression, law, ethics, and cross-cultural perspectives.

CDFS 678. FIELD EXPERIENCE IN MARRIAGE AND FAMILY THERAPY.
Prerequisite: CDFS 669.
Admission by consent of instructor.
(May be repeated for credit.)
Supervised clinical experience in a community agency working with a variety of marital and family problems. Depending on the number of credit hours for which one is registered, will require 8-24 clinic hours and 3-9 experiential hours per week.

CDFS 680. PROFESSIONAL ISSUES FOR CHILD AND FAMILY SPECIALISTS.
Prerequisite: Admission to doctoral studies or consent of instructor.
Professional issues involved in working with children and families. Questions of ethics, legal relationships, and value problems may be pursued, as may such pragmatic inquiries as the role of professional organizations and labor unions in these fields.

CDFS 698. RESEARCH M.S. THESIS.

CIVIL ENGINEERING

CE 273. MECHANICS OF MATERIALS.
Class 3, cr. 3.
Prerequisite: MA 261, ME 271.
Analysis of stress and strain, Mohr's circle, equations of equilibrium and compatibility; stress-strain laws; extension, torsions, bending and deflection of beams, buckling of columns, elastic stability and strain energy, Castigliano's Theorem, pressure vessels, selected topics.

CE 570. ADVANCED STRUCTURAL MECHANICS.
Class 3, cr. 3.
Prerequisite: CE 270 or CE 273.
Studies of stress and strain, failure theories, and yield criteria; flexure and torsion theories for solid and thin-walled members; and energy methods.

CE 574. STRUCTURAL RELIABILITY.
Class 3, cr. 3.
Prerequisite: CE 392 and one course in structural design, or consent of instructor.
Elements of probability theory and its application to structural engineering, statistical distributions of load, probable strength of structural elements and machine parts; safety analysis and reliability prediction of structural and mechanical systems; reliability-based designs.

CE 577. ANALYSIS OF PLATES AND SHELLS.
Class 3, cr. 3.
Prerequisites: MA 262, CE 270.
Kirchhoff plate bending theory, analytical solution of circular plates, classical solution of rectangular plates by Navier and Levy methods, and by numerical techniques of Rayleigh-Ritz, finite difference and finite element methods. Analytical solution of shells of revolution based on membrane and bending theories, and numerical solution by the finite element method.

CIVIL ENGINEERING TECHNOLGY

CET 100. TECHNICAL COMPUTATIONS.
Class 3, cr. 3.
A study of elements from algebra and trigonometry appropriate to surveying, estimating, statistics, and other construction-related courses. The use of calculators and computers and programming skills are stressed. Graphs and reports are included.

CET 104. ELEMENTARY SURVEYING.
Class 2, Lab. 3, cr. 3.
Prerequisite: MA 147 or equivalent.
Measurement of distances, directions and angles, using the tape, level, compass and transit. Computation of areas and traverses, lines and grades.

CET 160. STATICS.
Class 3, cr. 3.
Corequisite: MA 148 or equivalent.
Study of forces acting on bodies at rest. Coplanar and non-coplanar forces, concurrent and non-concurrent forces, friction forces, hydros-

tatic forces, centroids and moments of inertia will be studied.

CET 208. ROUTE SURVEYING.
Class 2, Lab. 3, cr. 3.
Prerequisite: CET 104.
Preliminary and construction surveys for highways and railroads, including calculation and field work for simple, compound, reverse, and easement curves, grade lines and slope stakes and the superelevation of curves. Preparation of plans, profiles and cross sections from field survey data. Earth-work estimates.

CET 209. LAND SURVEYING AND SUBDIVISION.
Class 1, Lab. 6, cr. 3.
Prerequisites: CET 208 and CET 253.
Theory and practice of land surveying, subdivision, filing and recording deeds, United States government survey of public lands, laws of land surveying, descriptions and area computations for land surveys. Subdivision planning, calculations and plotting, water main layouts, storm and sanitary sewer calculations and layouts. Street plans and profiles.

CET 253. HYDRAULICS AND DRAINAGE.
Class 3, cr. 3.
Prerequisite: CET 160 or equivalent.
corequisite: MA 221 or equivalent.
Basic hydrostatics, Bernouilli's equation, flow in water and sewer lines, overland and ditch drainage, and culvert size determination.

CET 260. STRENGTH OF MATERIALS.
Class 3, cr. 3.
Prerequisite: CET 160 or equivalent.
Corequisite: MA 221 or equivalent.
Study of stress-strain relationships, shear and bending moment diagrams, stresses and deflections of beams, axial loads, and combined stresses. Applied problems in the field of structural design.

CET 266. MATERIALS TESTING.
Class 2, Lab. 3, cr. 3 or Class 1, Lab. 6, cr. 3.
Prerequisite: CET 260.
Not open to students with credit in MET 266.
Testing of construction materials to determine physical and mechanical properties. Preparation of reports from data secured from such tests.

CET 280. STRUCTURAL CALCULATIONS.
Class 3, cr. 3.
Prerequisite: CET 260.
Practice in the calculation of loads, reactions, shear, and moment for determinate structures. Introduction to indeterminate structures with emphasis on moment distribution.

CET 282. STRUCTURAL DETAILING.
Class 1, Lab. 6, cr. 3.
Prerequisites: CET 260 and ARET 150.
Detailing simple structural steel, reinforced concrete and wood structures, elementary design principles.

CET 299. CIVIL ENGINEERING TECHNOLOGY.
Cr. 1-4.
Hours to be arranged with the staff. Primarily for third and fourth semester students. Subject matter to be assigned by the staff.

CET 306. CONSTRUCTION SURVEYING.
Class 2, Lab. 3, cr. 3.
Prerequisite: CET 104 or equivalent.
Application of surveying skills relevant to the construction field. Projects include: layout of commercial and industrial buildings, transfer or horizontal and vertical control, establishment of route center-lines, establishment of lines and grades, determination of earthwork quantities, establishing slope stakes, triangulation, topographic mapping, etc. Instruments used will include transits, theodolites, automatic levels, construction lasers, and EDMs.

CET 331. PROPERTIES AND BEHAVIOR OF SOILS.
Class 2, Lab. 3, cr. 3.
Prerequisite: CET 266.
Identification and properties of soils with emphasis on laboratory and field testing. Behavior of soils relating to design and construction of structures and highways.

CET 382. STEEL CONSTRUCTION.
Class 2, Lab. 3, cr. 3.
Prerequisite: CET 280.
Design of steel framed structures, including beams, columns, and connections. A study of erection practices.

CET 384. WOOD CONSTRUCTION.
Class 2, Lab. 3, cr. 3.
Prerequisite: CET 280.
Design of wood frame construction and the formwork for concrete construction, including the preparation of structural and construction drawings.

CET 386. REINFORCED CONCRETE CONSTRUCTION.
Class 2, Lab. 3, cr. 3.
Prerequisite: CET 280.
A study of concrete as both a construction and a structural material. Field methods and practices used in concrete construction. Fundamentals of reinforced concrete design as applied to beams, slabs, columns, walls, and footings. The testing of reinforced concrete structural members.

CET 408. CONSTRUCTION OF HIGHWAYS.
Class 2, Lab. 3, cr. 3.
Prerequisites: CET 331 and CET 208.
Materials, design and methods used in flexible and rigid pavement construction. Topics include preliminary layout and design of intersections and highways, soils requirements, subgrade requirements, drainage requirements, construction procedures, and maintenance.

CET 409. PROPERTY SURVEYING.
Class 2, Lab. 3, cr. 3.
Prerequisite: CET 209.
Office and field work associated with land surveying. Laws of land surveying, and public records of real property. Metes and bounds. Federal subdivision, and state plane coordinate descriptions.

CET 432. FOUNDATION CONSTRUCTION.
Class 3, cr. 3.
Prerequisites: CET 331 and CET 386 or equivalent.
A study of the design principles, construction methods, equipment, and construction procedures used in constructing shallow and deep foundations. Excavation procedures, temporary bracing, construction site dewatering, and loads on underground structures will also be studied.

CET 499. CIVIL ENGINEERING TECHNOLOGY.
Cr. 1-4.
Hours, subject matter and credit to be arranged by staff. Course may be repeated for credit up to 9 hours.

CHEMISTRY

CHM 091. COOPERATIVE WORK EXPERIENCE I.
Cr. 0.
Prerequisite: must be accepted for the program by the Cooperative Education Program coordinator.
For cooperative education program students only.

CHM 092. COOPERATIVE WORK EXPERIENCE II.
Cr. 0.
Prerequisite: CHM 091.

CHM 093. COOPERATIVE WORK EXPERIENCE III.
Cr. 0.
Prerequisite: CHM 092.

CHM 094. COOPERATIVE WORK EXPERIENCE IV.
Prerequisite: CHM 093.

CHM 095. COOPERATIVE WORK EXPERIENCE V.
Cr. 0.
Prerequisite: CHM 094.

CHM 096. WORK EXPERIENCE I.
Cr. 0.
For Professional Practice Program students only.
Prerequisite: student must be accepted for the program by the Departmental Professional Practice Program Coordinator.

CHM 097. WORK EXPERIENCE II.
Cr. 0.
Prerequisite: CHM 096.

CHM 098. WORK EXPERIENCE III.
Cr. 0.
Prerequisite: CHM 097.

CHM 099. WORK EXPERIENCE IV.
Cr. 0.
Prerequisite: CHM 098.

CHM 111. GENERAL CHEMISTRY.
Class 2, Lab. 3, cr. 3.
Laws and principles of chemistry, with special emphasis on applications and topics of importance in technology. Preparation equivalent to one year of high school chemistry is recommended for students enrolling in this course. Students with inadequate preparation should enroll in GNS-160.

CHM 112. GENERAL CHEMISTRY.
Class 2, Lab 3, cr. 3.
Prerequisite: CHM 111 or equivalent.
Continuation of CHM 111.

CHM 115. GENERAL CHEMISTRY.
Class 3, Lab. 3, cr. 4.
Required of students majoring in chemistry, physics, and engineering.
Laws and principles of chemistry, with special emphasis on topics of importance in science and engineering. Numerical problems and relationships are introduced whenever quantitative treatment is possible. Preparation equivalent to one year of high school chemistry is strongly recommended for students enrolling in this course. Students with inadequate preparation should enroll in CHM 111.

CHM 116. GENERAL CHEMISTRY.
Class 3, Lab. 3, cr. 4.
Prerequisite: CHM 115 or equivalent.
A continuation of CHM 115.

CHM 119. GENERAL CHEMISTRY.
Class 2, Lab. 3, cr. 3.
A survey of general, organic, and biological chemistry. Intended primarily for students in the nursing program but may be taken by others with the consent of the instructor.

CHM 131. CHEMISTRY AND ECOLOGY.
Class 2, Lab. 3, cr. 3.
An introduction to the application of chemical principles to the world around us (our environment). It may be used in satisfaction of the physical science requirement for the School of Liberal Arts and Sciences.

CHM 132. CHEMISTRY AND ECOLOGY.
Class 2, Lab. 3, cr. 3.
Prerequisite: CHM 131 or equivalent.
A continuation of CHM 131.

CHM 215. LABORATORY HEALTH AND SAFETY.
Class 1, cr. 1.
Prerequisites: one year of Chemistry.
Emphasis on the principles of prudent practice in the use and storage of laboratory equipment and materials, including consideration of governmental regulations regarding the disposal of toxic and hazardous materials.

CHM 220. GENERAL CHEMISTRY.
Class 2, Lab. 3, cr. 3.
Prerequisite: CHM 116.
Prerequisite or corequisite: MA 164 or equivalent.
Recommended for students who have completed CHM 115 and 116 and who are planning to take CHM 373 or CHM 321.
A consideration of certain principles of general and analytical chemistry which are not covered in CHM 115 and 116. This course is designed to bridge the gap between the course sequences CHM 115-116 and 135-136.

CHM 223. INTRODUCTORY QUALITATIVE ANALYSIS.
Class 2, Lab. 6, cr. 4.
Prerequisite: CHM 112 or 116.
Introduction to semimicro qualitative analysis.

CHM 224. INTRODUCTORY QUANTITATIVE ANALYSIS.
Class 2, Lab. 6, cr. 4.
Prerequisite: CHM 112 or 116.
Preparation equivalent to CHM 223 is strongly recommended for students enrolling in this course.
Introduction to titrimetric, gravimetric, and instrumental methods of analysis.

CHM 241. INTRODUCTORY INORGANIC CHEMISTRY.
Class 3, lab. 3, cr. 4.
Prerequisite: CHM 116 or 136.
Descriptive inorganic chemistry dealing in a systematic way with the elements and the structures, properties, and reactions of their compounds.

CHM 251. ORGANIC CHEMISTRY.
Class 4, cr. 4.
Prerequisite: CHM 112 or 116.
Introductory organic chemistry. May be used as an introduction to CHM 319, but not CHM 533. Basic organic structures, reactions, and nomenclature are considered. Applications to industrial chemistry and biological systems are considered.

CHM 252. ORGANIC CHEMISTRY LABORATORY.
Lab. 3, cr. 1.
Corequisite: CHM 251 or equivalent.
Laboratory experiments to accompany CHM 251.

CHM 254. ORGANIC CHEMISTRY LABORATORY.
Lab. 3, cr. 1.
Prerequisite or corequisite: CHM 255.
Laboratory experiments to accompany CHM 255 illustrating methods of separation and the more common techniques and methods for preparing various types of organic compounds.

CHM 255. ORGANIC CHEMISTRY.
Class 3, cr. 3.
Prerequisite: CHM 112 or 116; recommended for biology majors.
A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc. (b) general syntheses and reactions, and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereo-chemistry, and relative rates.

CHM 256. ORGANIC CHEMISTRY.
Class 3, cr. 3.
Prerequisite: CHM 255 or equivalent.
A continuation of CHM 255 with various functional groups such as the carboxyl, carbonyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides.

CHM 258. ORGANIC CHEMISTRY LABORATORY.
Lab. 3, cr. 1.
Prerequisite of corequisite: CHM 256.
A continuation of CHM 254, but emphasizing methods for identifying organic compounds, including simple "unknowns."

CHM 261. ORGANIC CHEMISTRY.
Class 3, cr. 3.
Prerequisite: CHM 116 or equivalent.
Recommended for students majoring in chemistry or chemical engineering. A comprehensive study of the chemical principles underlying aliphatic and aromatic compounds. The syntheses and reactions of these materials are discussed. Modern theory and stereochemistry are stressed to illustrate the logic inherent in the subject matter and to demonstrate the predictability of many of the chemical transformations.

CHM 262. ORGANIC CHEMISTRY.
Class 3, cr. 3.
Prerequisite: CHM 261 or equivalent.
A continuation of CHM 261, but with a broader scope. The chemistry of a variety of functional groups is discussed. Theory is employed extensively to demonstrate the coherence underlying seemingly diverse transformations. Qualitative organic analysis is introduced, with particular emphasis on spectroscopic methods.

CHM 263. ORGANIC CHEMISTRY LABORATORY.
Lab. 3, cr. 1.
Corequisite: CHM 261 or equivalent.
Laboratory experiments designed to illustrate the lecture material of CHM 261. Elementary laboratory techniques essential to organic chemistry are introduced followed by the actual synthesis and purification of compounds discussed in CHM 261.

CHM 264. ORGANIC CHEMISTRY LABORATORY.
Lab. 3, cr. 1.
Corequisite: CHM 262 or equivalent.
A continuation of CHM 263 in that the experiments are designed to illustrate principles discussed in CHM 262. A major portion of the course is devoted to methods employed in organic qualitative analysis. The student is expected to identify several "unknown" compounds and mixtures.

CHM 265. ORGANIC CHEMISTRY LABORATORY.
Lab. 6, cr. 2.
Corequisite: CHM 261 or equivalent.
Similar to CHM 263 except that a larger number and more sophisticated organic syntheses are required. The preparations are designed, not only to illustrate the classical reactions discussed in CHM 261, but to allow for an extrapolation of the principles involved to other systems.

CHM 266. ORGANIC CHEMISTRY LABORATORY.
Lab. 6, cr. 2.
Corequisite: CHM 262 or equivalent.
A continuation of CHM 265. All experiments are designed to illustrate the principles discussed in CHM 262. A major portion of the course is devoted to the methods employed in organic qualitative analysis. The student is expected to identify "unknowns" and mixtures and is introduced to some modern instrumental techniques.

CHM 273. INTRODUCTORY PHYSICAL CHEMISTRY.
Class 3, cr. 3.
Prerequisites: MA 222 or equivalent and CHM 112 or equivalent.
An introductory treatment of the general properties of gases, liquids, and solids, with an emphasis on applications of physical chemistry in real systems. This course may be used by premedical, predental, biology, and technology students.

CHM 290. SELECTED TOPICS IN CHEMISTRY FOR LOWER DIVISION STUDENTS.
Cr. 1-4.
Prerequisite: consent of instructor.
Undergraduate special work, such as an individual project, not covered in other courses.

CHM 319. INTRODUCTION TO BIOCHEMISTRY.
Class 2, Lab. 3, cr. 3.
Prerequisite: CHM 119 or CHM 112 or CHM 116 or equivalent.
A survey of modern biochemistry. Emphasis will be on the structure of biomolecules, biochemical reactions related to human metabolic processes, and metabolic interrelationships. Open to all students.

CHM 320. INTRODUCTION TO BIOCHEMICAL TECHNIQUES.
Class 1, Lab. 3, cr. 2.
Prerequisites: CHM 251 and CHM 224 or equivalent.
A survey of the theoretical basis and practical application of modern biochemical techniques including separation, qualitative analysis, and quantitative analysis methods.

CHM 321. ANALYTICAL CHEMISTRY I.
Class 2, Lab. 6, cr. 4.
Prerequisites: CHM 136, or 220, and one year of organic chemistry. Required of students majoring in chemistry.
Quantitative measurements on complex chemical systems that show matrix effects or require isolation of a component prior to its determination; general approaches to quantitation problems at the trace level; critical comparisons of competitive procedures, with emphasis upon principles of separation processes, including chromatography; recognition and evaluation of possible sources of error; approaches for optimizing conditions so as to minimize time and/or effort required to attain prescribed levels of accuracy and precision.

CHM 333. PRINCIPLES OF BIOCHEMISTRY.
Class 3, cr. 3.
Prerequisites: One year of general chemistry and at least one semester of organic chemistry.
Structure and function of biologically important molecules. Intended for students in life science.

CHM 342. INORGANIC CHEMISTRY.
Class 3, cr. 3.
Prerequisite or corequisite: CHM 374.

Interpretation and correlation of the reactions and properties of inorganic compounds in terms of their electronic and molecular structures. A survey of the preparations and reactivities of important compounds of the representative elements with an emphasis on group trends. The elementary chemistry of the transition metals including magnetic and spectral properties of coordination compounds.

CHM 343. INORGANIC CHEMISTRY LABORATORY.
Lab. 3, cr. 1.
Corequisite: CHM 342 or equivalent.
Laboratory work to accompany CHM 342.

CHM 373. PHYSICAL CHEMISTRY.
Class 3, cr. 3.
Prerequisites: CHM 136, or 220, MA 261, and two semesters of college physics.
Properties of gases; kinetic molecular theory; introduction to atomic and molecular structure; classical thermodynamics, including chemical equilibria, molecular interpretation of thermodynamics.

CHM 374. PHYSICAL CHEMISTRY.
Class 3, cr. 3.
Prerequisite: CHM 373.
Phase equilibria, liquids, electrolytic solutions and cells, structure of atoms and molecules, spectroscopy, chemical kinetics, and solid state.

CHM 376. PHYSICAL CHEMISTRY LABORATORY.
Lab. 6, cr. 2.
Corequisite: CHM 374 or equivalent.
Laboratory portion of CHM 373 and 374.

CHM 424. ANALYTICAL CHEMISTRY II.
Class 2, Lab. 6, cr. 4.
Prerequisite: CHM 321; prerequisite or corequisite: CHM 374.
Principles and application of optical and electrical methods of chemical analysis, including topics in instrumentation.

CHM 444. COSMOCHEMISTRY.
Class 3, cr. 3.
Prerequisite or corequisite: CHM 374 or consent of instructor.
Nucleosynthesis and chemical abundances. Origin, composition, and structure of the earth and extraterrestrial objects. Isotope geology, geo- and cosmo-chronology with particular emphasis upon the moon and meteorites.

CHM 499. SPECIAL ASSIGNMENTS.
Lab. 3 to Lab. 15, cr. 1-5.
Undergraduate level special work, such as a senior thesis, not included in other courses.

CHM 502. MODERN CHEMISTRY IN THE HIGH SCHOOL.
Class 2, Lab. 3, cr. 3.
A critical discussion of the means by which the fundamentals of modern chemistry can best be introduced at the high school level. The laboratory will deal with the manufacture and use of lecture demonstration equipment, the use of films and film strips, and the problems involved in organizing and running a high school chemical laboratory.

CHM 504. ORGANIC CHEMISTRY.
Class 3, Lab. 3, cr. 4.
Prerequisite: a previous course in organic chemistry.
A general survey of practical and theoretical aspects of elementary organic chemistry followed by a more intensive study of a few selected topics. Designed primarily for secondary school teachers. Credit in this course may not be used toward a degree in chemistry.

CHM 505. ADVANCED CHEMISTRY FOR TEACHERS I.
Class 3, cr. 3.
Prerequisite: one year of college chemistry, and college mathematics.
Topics include atomic structure, modern theories of the chemical bond, a structured study of the Periodic Table, the chemical properties of the main group and transition elements, and chemical calculations. Modern concepts of inorganic chemistry will be introduced whenever possible. Designed primarily for junior or senior high school teachers. Credit in this course may not be used toward a graduate degree in chemistry.

CHM 506. ADVANCED CHEMISTRY FOR TEACHERS II.
Class 3, cr. 3.
Prerequisite: one year of college chemistry, and college mathematics.
Topics include chemical thermodynamics, chemical equilibria, electrochemistry, chemical kinetics, and nuclear chemistry, presented from a physical/analytical perspective. Designed primarily for junior and senior high school teachers. Credit in this course may not be used toward a graduate degree in chemistry.

CHM 513. CHEMICAL LITERATURE.
Class 1, cr. 1.
Types of information in technical publications; exercises in finding, assembling and using such data.

CHM 533. INTRODUCTORY BIOCHEMISTRY.
Class 3, cr. 3.
Prerequisites or corequisites: CHM 256 and CHM 321 or equivalent.
Chemistry and utilization in the living organisms of lipids, carbohydrates, proteins, enzymes, and hormones; physiological chemistry of the blood, urine, and other fluids and tissues; essentials of nutrition.

CHM 534. INTRODUCTORY BIOCHEMISTRY.
Class 3, cr. 3.
Prerequisite: CHM 533 or equivalent.
Continuation of CHM 533 with emphasis on enzymatic catalysis and metabolic transformations.

CHM 535. BIOCHEMISTRY LABORATORY.
Lab. 3, cr. 1.
Corequisite: CHM 534 or equivalent.
Laboratory work to accompany CHM 534.

CHM 548. RADIOCHEMISTRY.
Class 2, cr. 2.
Prerequisite: CHM 374 or equivalent.
Elements of nuclear chemistry; the uses of isotopes in chemical research; elementary principles of radiation chemistry.

CHM 549. RADIOCHEMISTRY LABORATORY.
Lab. 3, cr. 1.
Prerequisite or corequisite: CHM 548.
Laboratory work to accompany CHM 548.

CHM 561. ORGANIC CHEMISTRY.
Class 3, Lab. 3, cr. 4.
Prerequisite: a previous course in organic chemistry.
A general survey of practical and theoretical aspects of elementary organic chemistry followed by a more intensive study of a few selected topics. Designed primarily for secondary school teachers. This course may not be used toward a degree in chemistry.

CHM 562. INDUSTRIAL ORGANIC CHEMISTRY.
Class 3, cr. 3.
Prerequisite: CHM 262 or equivalent.

A survey of the use of the methods and principles of organic chemistry in the manufacture of commercially valuable products ultimately derived from petroleum, natural gas, coal, and biomass. Includes consideration of the preparation and uses of polymers, dyes, drugs, agrichemicals, food additives, and other bulk chemicals.

CHM 563. ORGANIC CHEMISTRY.
Class 3, cr. 3.
Prerequisite: CHM 262 or equivalent.
Ionic and free radical reactions are discussed critically with emphasis on the synthetic and mechanistic aspects of the reactions studied. Selected topics in physical organic chemistry.

CHM 599. SPECIAL ASSIGNMENTS.
Cr. 1-3.
Prerequisite: consent of instructor.
Graduate level directed reading or special work not included in other courses.

CHEMICAL TECHNOLOGY

CHT 201. UNIT OPERATIONS I.
Class 3, cr. 3.
Prerequisites: MA 148 or equivalent and CHM 112 or equivalent.
This course will acquaint the student with chemical process equipment, its use, and its applications. It focuses study on the principles, materials, systems of equipment, and some of the problems involved in chemical manufacturing processing. Chemical plant operations such as filtration, evaporation, drying, crystallization, solvent extraction, distillation, and fluid handling are described and discussed.

CHT 202. INDIVIDUAL PROJECTS IN CHEMICAL TECHNOLOGY.
Lab. 6, cr. 2.
Prerequisite or corequisite: CHT 225.
Each student will complete a project requiring the use of the library for research and laboratory to carry out the project. A written report of the project is required.

CHT 225. INSTRUMENTAL QUANTITATIVE ANALYSIS.
Class 3, Lab. 3, cr. 4.
Prerequisites: CHM 224, CHM 273.
An introduction to instrumental methods of analysis. Emphasis is placed on applications rather than design of instruments.

CHT 273. INTRODUCTORY PHYSICAL CHEMISTRY.
Class 3, cr. 3.
Prerequisites: MA 222, or equivalent, and CHM 112.
An introductory treatment of the general properties of gases, liquids, and solids. This course may be used by technology or science students.

COMPUTER INFORMATION SERVICES

CIS 100. COMPUTER UTILIZATION.
Class 2, Lab. 2 cr. 3.
Not for ISCP majors.
An introduction to data processing. Emphasis will be on how computers can assist the potential user. Students will be introduced to word processing, spreadsheets, and the basic concepts of Data Base Management systems. Intended primarily for the non-technical student.

CIS 103. INTRODUCTION TO BASIC PROGRAMMING.
Class 2, Lab. 2, cr. 3.
Not for ISCP majors.
Prerequisite: CIS 100.
An introduction to the program development cycle, logic diagrams and programming in the BASIC language for undergraduates in humanities, social sciences, education, industrial management, engineering, and technology. Extensive programming exercises are assigned.

CIS 104. BASIC PROGRAMMING.
Class 1, cr. 1.
Not for ISCP majors.
Prerequisite: CIS 100.
This course will provide an introduction to the BASIC programming language, flowcharts, and elementary program development. Course runs concurrently with CIS 204, Introduction to Computer-Based Systems, during the last half of the semester.

CIS 160. COMPUTERS AND DATA PROCESSING.
Class 3, Lab. 2, cr. 4.
Pre- or corequisite: MA 153 or higher level mathematics.
An introduction to computers and data processing. Students will be introduced to the theory and applications of computers including subsystems of a computer, input/output media, historical development, base systems, spreadsheets, logic diagrams, and programming.

CIS 200. COMPUTER PROGRAMMING FUNDAMENTALS.
Class 3 or Class 2, Lab. 2, cr. 3.
Not for ISCP majors.
The presentation of the basic elements of programming digital computers. Practical problems in the student's major area are considered in laboratory exercises. Major emphasis will be on FORTRAN programming.

CIS 204. INTRODUCTION TO COMPUTER-BASED SYSTEMS.
Class 2, Lab. 2, cr. 3.
An introduction to computer-based systems with an emphasis on how computers can assist the user. Computer concepts, terminology, and a survey of programming languages, operating systems, word processing, spreadsheets, database, communications, graphics, and bulletin board systems are included. Extensive laboratory exercises are assigned.

CIS 205. INFORMATION SYSTEMS FOR MANAGEMENT.
Class 3, cr. 3.
Not for ISCP majors.
Prerequisite: CIS 204.
An integrated approach to Management Information Systems with emphasis on business systems analysis, design, development and implementation. A case problem will be presented which the students will implement via the above approach.

CIS 206.BASIC PROGRAMMING.
Class 2, Lab. 2, cr.3.
Pre or Corequisite: CIS 204.
An introduction to the program development cycle, logic diagrams, debugging procedures, top-down design, top-down programming, and structured programming. The BASIC programming language is used to implement program solutions. Extensive programming exercises are assigned.

CIS 210. PERSONAL COMPUTER TECHNOLOGY.
Class 3, cr. 3.
Prerequisite: One personal computer course or consent of instructor.
The personal computer is explored at the application level. Topics covered include an in-depth study of DOS commands and application software review. An overview of digital circuits, the internal structure of microcomputers, microchip differences, PC communications, microcomputer operating systems and peripheral devices are dis-

cussed in relation to the evaluation of PC hardware and software. New technology topics round out the course.

CIS 232. ASSEMBLY LANGUAGE PROGRAMMING.
Class 3, Lab. 2, cr. 4.
Prerequisite or corequisite: CIS 262.
Programming at the assembly language level. Topics include base and displacement addressing, reading memory dumps, machine and assembler instructions including packed and binary arithmetic. Students are assigned several programming projects with emphasis on top-down program development.

CIS 233. ADVANCED ASSEMBLER.
Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 232.
A continuation of CIS 232 with emphasis on table processing, parsing, internal and external subprograms and the construction and use of Macros on an IBM mainframe. Students are assigned several programming exercises.

CIS 251. COMMERCIAL SYSTEMS.
Class 3 or Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 204 Pre- or Corequisite: MGMT 200.
An introduction to key business data processing applications, word processing, spreadsheets and file management systems. Topics include flow of data and control through systems like payroll, order entry, accounts receivable, accounts payable, inventory, and general ledger. Students will be exposed to these applications, as well as word processing, spreadsheets, and file management systems, on microcomputers.

CIS 252. SYSTEMS ANALYSIS AND DESIGN.
Class 3, cr. 3.
Prerequisites: CIS 251 and CIS 265.
An introduction to the procedural requirements of the system cycle. Through actual problem solution, the student is introduced to the techniques of system planning, analysis, form and file design, documentation, implementation, and evaluation.

CIS 253. APPLIED DATABASE TECHNIQUES.
Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 251 and CIS 265.
An introduction to the applied aspects of database systems and their associated languages. Topics include database terminology and concepts including data modeling, data dictionaries, redundancy, independence, security, privacy, and integrity. Extensive laboratory exercises are assigned.

CIS 260. STRUCTURED PROGRAMMING.
Class 3, Lab. 2, cr. 4.
Prerequisite: CIS 204.
Introduction to programming using a structured approach. Emphasis is on program design and construction techniques which enforce good programming practices. Extensive laboratory exercises are assigned.

CIS 261. RPG PROGRAMMING.
Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 262.
An introduction to programming in RPG II. Extensive programming exercises are assigned including report generation, control breaks and the creation and maintenance of indexed files.

CIS 262. C PROGRAMMING.
Class 3, Lab. 2, cr. 4.
Prerequisite: CIS 204 and CIS 206.
A study of the C programming language. Topics include identifiers, datatypes, relational and logical operators, functions, expressions and statements, storage classes, loops, selections, formatted input and output, array processing, structures, and pointers. Students are assigned several programming projects with an emphasis on structured programming and top-down programming development.

CIS 264. FORTRAN PROGRAMMING.
Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 262.
The structure and details of FORTRAN, a mathematically oriented computer programming language. Numerous problems are solved on the computer to demonstrate and develop confidence in the many facets of the language.

CIS 265. COBOL PROGRAMMING.
Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 262.
A study of the programming language, ANS COBOL, which is especially useful for file and table handling and extensive input and output operations. The student will study the structure and details of COBOL and perform programming exercises dealing with practical applications like sorting, table handling, selection and file maintenance using sequential, indexed and direct files.

CIS 286. COMPUTER OPERATING SYSTEMS I.
Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 232.
An introduction to computer operating systems and other systems software. Topics include: supervisor organization, utility programs, job control language, program supervisor macros, loaders, and link-editors.

CIS 290. COMPUTER PROJECT.
Cr 1-4.
Prerequisite: Consent of department head.
Independent study for sophomore students who desire to execute a computer-oriented project. Course may be repeated for up to six hours credit.

CIS 291. INDUSTRIAL PRACTICE I.
Cr. 0.
Prerequisite: Admission to the Cooperative Education program.
Prerequisite: Practice in industry with written reports of this practice by the co-op student.

CIS 292. INDUSTRIAL PRACTICE II.
Cr. 0.
Prerequisite: Admission to the Cooperative Education program.
Prerequisite: Practice in industry with written reports of this practice by the co-op student.

CIS 294. DATA PROCESSING SEMINAR.
Class 3, cr. 2.
Prerequisite: Fourth Semester Standing.
Current problems and issues in the computer field are discussed.

CIS 299. INFORMATION SYSTEMS AND COMPUTER PROGRAMMING.
Cr. 1-4.
Hours, credit and subject matter to be arranged by staff. May be repeated for up to nine hours credit.

CIS 301. DATA AND FILE STRUCTURES.
Class 3, cr. 3., or Class 3, Lab. 2, cr. 3.
Prerequisites: CIS 262 and 286.
Methods of organizing, linking, and retrieving information stored in computer memory or auxiliary storage: arrays, lists, stacks, queues, linked lists, trees. File organization and access: sequential, random, indexed, linked, inverted, partitioned. Associated data manipulation algo-

rithms: data entry, searching, retrieval, sorting; algorithmic analysis. Selected applications.

CIS 333. CONCEPTS OF SYSTEMS SOFTWARE.
Class 2, Lab. 2, cr. 3.
Prerequisites: CIS 233 and 301.
An introduction to the major components of systems software and programming systems. Topics include: assemblers, loaders, macro processors, software tools, and other systems software topics.

CIS 340. DATA COMMUNICATIONS.
Class 3, cr. 3.
Prerequisite: CIS 286.
The role of data communications in modern computation, real time systems and data transmission. Topics include terminal equipment, communication media, data codes, error detection and correction, and terminal software.

CIS 345. COMPUTER GRAPHICS.
Class 2, Lab. 2, cr. 3.
Prerequisite: An introductory computer course.
A survey of computer hardware used to make graphic displays including printers, plotters, and cathode ray tubes. Programming techniques for plotting lines and special symbols, and the organization and representation of data, and a survey of applications.

CIS 351. DECISION SUPPORT AND EXPERT SYSTEMS.
Class 3, Lab. 0 or Class 2, Lab. 2, cr. 3.
Prerequisite: MGMT 305 and Fifth Semester Standing in CIS program.
Introduction to techniques employed in supporting decision-making in business, industry and government. Various types of models are developed and solved using manual and computerized techniques. Students analyze, prepare a model for, and develop solutions for selected types of problems. Decision support software packages may be specified to implement some solutions. Topics include an overview and relationship to Artificial Intelligence, project management, optimization techniques, statistical analysis, graphical analysis, inventory theory, simulation techniques, building management models, and presentations of results.

CIS 353. DATABASE SYSTEMS.
Class 4 or Class 3, Lab. 2, cr. 4.
Prerequisites: CIS 253 and 365.
An introduction to database processing concepts with emphasis on logical design and implementation of databases. Topics include database models, logical/physical data structures, DBMS design techniques, database administration, distributed databases and the evaluation of state-of-the-art DBMS software. Students will be assigned design projects.

CIS 354. DATABASE MANAGEMENT SYSTEMS ANALYSIS & DESIGN.
Class 3, cr. 3.
Prerequisite: Junior standing in CIS program.
This course discusses the role of databases in the System Development Life Cycle, with an emphasis on relational database analysis and design techniques—logical data modeling. Additional topics include the functions and components of "state-of-the-art" commercial DBMS software, distributed databases, database models, and the role and function of the Database Administrator. Students will be assigned analysis and design projects.

CIS 355. DATABASE MANAGEMENT APPLICATION.
Class 2, Lab. 2, cr. 3.
Prerequisite: Fifth semester standing in CIS program.
This course emphasizes the implementation of a relational DBMS. Students will use fourth generation languages and tools to implement design specifications. Additional topics include the implementation of physical data models, back-up/recovery facilities, concurrency control, integrity services and security mechanisms. Students will be assigned implementation projects.

CIS 365. TOPICS IN COBOL.
Class 3, cr. 3.
Prerequisite: CIS 265.
Advanced COBOL topics concerning indexed files with variable length records, direct files, sophisticated table handling employing subscripting and indexing, simulation and subprogram use. The Report Writer feature of COBOL is also introduced. Programming exercises include advanced file mainenance techniques and menu-driven programs.

CIS 373. DISTRIBUTED DATA PROCESSING SYSTEMS.
Class 3, cr. 3.
Prerequisite: CIS 253.
The features of centralized, decentralized and distributed systems will be examined. The impact of distributed systems on the business enterprise will be exposed via the medium of case studies. Technology implications of computer hardware, software and communications are discussed as they relate to the design, development and implementation of distributed data processing systems.

CIS 383. ON-LINE PROGRAMMING TECHNIQUES.
Class 3, or Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 365.
An introduction to Command Level CICS used to illustrate the concepts and considerations required in the design development and implementation of on-line application programs. CICS commands, program design, programming, screen maps, debugging and testing are covered utilitizing business oriented assignments.

CIS 386. COMPUTER OPERATING SYSTEMS II.
Class 2, Lab. 2, cr. 3.
Prerequisites: CIS 286 and CIS 333.
A continuation of CIS 286 with emphasis on systems generation, control languages, and systems software.

CIS 393. INDUSTRIAL PRACTICE III.
Cr. 0.
Prerequisite: CIS 292.
Practice in industry with written reports of the practice by the co-op student.

CIS 394. INDUSTRIAL PRACTICE IV.
Cr. 0.
Prerequisite: CIS 393.
Practice in industry with written reports of the practice by the co-op student.

CIS 395. INDUSTRIAL PRACTICE V.
Cr. 0.
Prerequisite: CIS 394.
Practice in industry with written reports of the practice by the co-op student.

CIS 396. COMPUTER LABORATORY.
Lab. 1-6, cr. 1-2.
Applied computer laboratory experiences carried out on an independent study basis in conjunction with other courses, assignments, or problems.

CIS 413. EDP AUDITING AND CONTROL.
Class 3, cr. 3.
Prerequisites: MGMT 310 and CIS 424.
An introduction to the fundamentals of EDP auditing. Emphasis on understanding EDP controls, the types of EDP audits, and the concepts and techniques used in EDP audits. Exposure to risk assessment and professional standards in the field of EDP auditing are provided.

CIS 423. STRUCTURED SYSTEMS ANALYSIS AND DESIGN.
Class 3, cr. 3.
Prerequisites: CIS 252 and Junior standing in CIS program.
This is the first semester of a two-semester sequence in the advanced study of the system development life cycle. Topics include analysis and design using structured techniques to analyze existing information systems, preparing the associated structured documentation and to design new computer information systems, preparing the technical specification to implement the system.

CIS 424. ADVANCED STRUCTURED TECHNIQUES.
Class 3, cr.3.
Prerequisite: CIS 423.
This is the second semester of a two-semester sequence in the advanced study of the system life cycle. Topics include the techniques used to support structured analysis and design such as project management, software quality assurance, computer-assisted software engineering (CASE), and any state-of-the-art techniques that the software engineering profession introduces to support the systems development process.

CIS 425. STRUCTURED SYSTEMS ANALYSIS AND DESIGN.
Class 3, cr. 3.
Prerequisites: CIS 252, CIS 383, and Senior Class Standing.
Study of the system development life cycle. Emphasis on strategies and techniques of structured analysis and structured design for producing logical systems specifications and for deriving physical systems designs. Coverage of methodologies for dealing with complexity in the development of information systems.

CIS 426. APPLIED SOFTWARE DEVELOPMENT PROJECT.
Class 3 or Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 425.
A capstone course integrating the knowledge and abilities gained through the other computer related courses in the curriculum within a comprehensive system development project.

CIS 452. MANAGEMENT INFORMATION SYSTEMS I.
Class 3, or Class 2, Lab. 2, cr. 3.
Prerequisites: Statistics and a compiler language.
Topics in operations research. Students will apply manual and programming techniques to solve simulations, integer, zero-one, linear programming, waiting line, and other types of problems.

CIS 453. DATA BASE MANAGEMENT SYSTEMS.
Class 3, cr. 3.
Prerequisite: CIS 365.
Logical and physical data structures, data base design, design objectives and commercial database management systems. Hierarchical, network and relational models are introduced along with such concepts as query languages, data dictionaries and distributed networks.

CIS 454. MANAGEMENT INFORMATION SYSTEMS II.
Class 3, or Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 425.
The organization and processing of data in an integrated management information systems environment with emphasis on the source, dissemination and interrelationship of data required for various operational areas of an industrial organization. A capstone course.

CIS 460. PROGRAMMING SYSTEMS.
Class 3, cr. 3.
Prerequisite: CIS 301.
A broad overview of some basic and advanced concepts in higher level languages and their design. Emphasis is on issues and breadth rather than on details. Topics cover basic characteristics of programming languages, formal methods of defining syntax and semantics, broad language areas of string and list processing, formula manipulation, on-line commands, simulation, concepts of languages for specialized application areas and for program validation, and current research topics and technical issues.

CIS 483. COMPUTER HARDWARE/SOFTWARE SELECTION.
Class 4, cr. 4.
Prerequisites: CIS 383 and Senior Class Standing.
This course is designed to provide EDP technical personal with information required to plan, design, and select computer systems. Included are the formulation of corporate requirements, configuration of hardware and software to satisfy stated requirements, comparison and evaluation of hardware and software, installation considerations, implementation procedures, performance measurement approaches and contract negotiations.

CIS 485. TOPICS IN INFORMATION SYSTEMS AND COMPUTER PROGRAMMING.
Class 3, cr. 3.
Final semester course to acquaint students with the "state-of-the-art." Special guest lecturers, field trips, and one to several-session series lectures are utilized to cover pertinent topics.

CIS 486. SYSTEMS PROGRAMMING.
Class 2, Lab. 2, cr. 3.
Prerequisite: CIS 386.
Programming and maintenance of Software packages. Software areas to be covered include operating systems, subroutine sets, assemblers, compilers, and microprogramming.

CIS 490. SENIOR PROJECT.
Cr. 1-4.
Prerequisite: Consent of department head.
Independent study for seniors who desire to execute a complete computer oriented project.

CIS 497. COMPUTER AND INFORMATIONAL SYSTEMS.
Cr. 1-4.
Prerequisite: Consent of department head.
Hours, credit, and subject matter to be arranged by staff.

CONSTRUCTION TECHNOLOGY

CNT 341. CONSTRUCTION OPERATIONS.
Class 4, cr. 4.
Prerequisite: Junior standing.
Management, methods and equipment used in the construction of buildings, earthworks, bridges and roads. Contractor organization, job management, and safety. Excavation, formwork, concrete, masonry, and steel erection methods.

CNT 344. CONSTRUCTION INSPECTION.
Class 2, Lab. 3, cr. 3.
Prerequisite: ARET 376 and CNT 341.
Inspection procedures as applied to contracted construction, and the role inspection plays in the execution of the completed contract. The laboratory period is used for demonstration, guest lecturer presentations, and for field trips to construction sites, fabrication shops, and testing laboratories.

CNT 380. QUANTITY SURVEY AND ESTIMATING.
Class 2, Lab. 3, cr. 3.
Prerequisite: ARET 150.
A study of methods to estimate quantities of materials required in construction. Practice in making quantity surveys. Introduction to estimating labor and costs.

CNT 442. CONSTRUCTION COSTS AND BIDDING.
Class 2, Lab. 3, cr. 3.
Prerequisites: CNT 380 and CNT 341.
Estimating total job costs, and the study of bidding practices of the construction industry. Topics include: unit costs of materials and labor, quantity survey, overhead, subcontracts, total estimated costs, and bid price. The laboratory period is for the development of costs for an actual job.

CNT 445. CONSTRUCTION MANAGEMENT.
Class 3, cr. 3.
Prerequisite: CNT 450, CNT 344, CNT 341.
Business policy and problems as they relate to construction companies. Contractors' organization, financial management, project management, supervision, cost analysis, and equipment economics.

CNT 450. CONSTRUCTION SCHEDULING.
Class 3, cr. 3.
Prerequisite: CNT 341.
A study of the planning and control of construction projects. Time schedules for materials, labor and equipment, expediting material delivery, bar charts, Critical Path Method (CPM) scheduling. Precedence diagrams and Program Evaluation Review Techniques (PERT). The course emphasizes the use of computers for scheduling and updating of the construction process.

CNT 489. SENIOR PROJECT SURVEY.
Students will develop a topic for the following design project, CNT 490. They will develop project scope & establish time schedules for completion of the project. Students are encouraged to develop alternate proposals. This course should be taken pass/no pass.

CNT 490. SENIOR PROJECT.
Class 3, cr. 3.
Prerequisite: Senior standing.
The development of a project which will combine the skill and knowledge gained from various areas of study. The student will be expected to present a project which has been approved by his faculty advisor to a panel of departmental faculty chosen by the advisor. This presentation should include graphical material as well as oral and written communication.

CNT 499. SPECIAL ASSIGNMENTS.
Cr. 1-4.
Hours, subject matter and credit to be arranged by staff. Course may be repeated for credit up to 9 hours.

COMMUNICATION

COM 114. FUNDAMENTALS OF SPEECH COMMUNICATION.
Class 3, cr 3.
A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and conflict resolution.

COM 115. FUNDAMENTALS OF PUBLIC SPEAKING.
Class 2, Lab. 2, cr. 3.
The focus of the course is on the preparation, organization, and oral delivery of messages to audiences in practical situations encountered in professional life.

COM 201. INTRODUCTION TO MASS MEDIA.
Class 3, cr. 3.
This course is designed to help students understand the critical processes and roles of mass media in contemporary life. A survey of the history, functions, and responsibilities of newspapers, magazines, motion pictures, video, sound recording, radio, television, public relations and advertising.

COM 202. ELECTRONIC MEDIA.
Class 3, cr. 3.
Prerequisite: COM 201.
(Not open to students with credit in COM 130.)
Origin, development, nature, and function of radio and television in America.

COM 210. DEBATING PUBLIC ISSUES.
Class 3, cr. 3.
Prerequisite: COM 114.
Study of organization as applied to public discourse. Lectures on logic and reasoning, library research methods, and bibliography, identification and analysis of issues, construction of organization of cases, refutation and rebuttal, and the phrasing and delivery of the argumentative speech. Preparation of debate cases.

COM 211. PRACTICUM IN SPEECH COMMUNICATION ACTIVITIES.
Lab. 2, cr. 1. or Lab. 4, cr. 2.
Prerequisite: consent of instructor
(May be repeated for credit, maximum total four credits.)
Practice and training in the theory and techniques of applied communication activities. May include projects in organizational communication or public relations, public presentations, or participation in competitive forensic events.

COM 213. VOICE AND DICTION.
Class 3, cr. 3.
Prerequisite: COM 114.
Introduction to the contemporary theories of interpersonal communication, with particular focus on the implications of the theories for the process of interpersonal and intrapersonal communication. Investigation and comparative analysis of rhetorical theories, linguistic theories, behavioral theories, quantitative theories, and psychological theories will be emphasized, as will be construction and analysis of models of communication.

COM 225. INTRODUCTION TO RHETORIC AND SOCIAL INFLUENCE.
Class 3, cr. 3.
Prerequisite: COM 114.
A study of rhetoric as an agent of social change. Analysis of strategies and techniques of nonoratorical as well as oratorical forms of contemporary rhetorical situations.

COM 241. PRACTICUM IN ORAL INTERPRETATION.
Lab. 2 or 4, cr. 1 or 2.
Prerequisite: consent of instructor. (May be repeated for credit; maximum total four credits.)
Practical training and experimentation in individual and ensemble oral interpretation.

COM 250. MASS COMMUNICATION AND SOCIETY.
Class 3, cr. 2.
A survey of the print, broadcast and film media in their relationship and influence on society. Study topics include: mass communication theories, documentaries, commercialism, news media, media effects and control, feedback, educational broadcasting, and audience analysis.

COM 253. INTRODUCTION TO PUBLIC RELATIONS.
Class 3, cr. 3.
Prerequisite: either COM 114 or 115.
Theories, methods, and practice of public relations; their application in industry, government, education, social agencies, and other institutions.

COM 254. RADIO AND TELEVISION PERFORMANCE.
Class 1, Lab. 4, cr. 3.
Prerequisite: COM 114 and 202 or consent of instructor.
Study and practice in radio and television communication, continuity, news, interview, discussion, music, commercials, drama; basic voice instruction and technical orientation.

COM 255. INTRODUCTION TO NEWS WRITING AND EDITING.
Class 3, Lab. 1, cr. 3.
Prerequisite: ENGL 103 or ENGL 105.
Fundamental of gathering, evaluating, writing, and editing news. (Basic typing ability desirable.)

COM 300. INTRODUCTION TO RESEARCH IN COMMUNICATION.
Class 3, cr. 3.
Introduction to the development and application of historical, critical, and empirical research methods pertinent to communication problems. Fundamental concepts of problem identification, sampling, surveys, historical sources, critical models, reliability and validity of both measurement and research design in communication research.

COM 310. FAMILY COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 114.
The application of theories of interpersonal communication to family life. Emphasis on feedback, empathy, and trust as contributing factors to effective communication within families. A case study approach is used.

COM 314. ADVANCED PUBLIC SPEAKING.
Class 3, cr. 3.
Prerequisite: COM 114 or 115.
Development of a marked degree of skill in the composition and delivery of various types of speeches; special emphasis on speeches related to the student's major vocational area.

COM 315. SPEECH COMMUNICATION OF TECHNICAL INFORMATION.
Class 3, cr. 3.
Prerequisite: COM 114.
Open only to students enrolled in the departments of Technology.
The organization and presentation of information of a practical technical nature. Emphasis is placed upon the study, preparation, and use of audio-visual materials in such presentations.

COM 318. PRINCIPLES OF PERSUASION.
Class 3, cr. 3.
Prerequisite: COM 114 or consent of instructor.
Persuasion and its effects on behavior with emphasis on evidence and reasoning and on emotional and personal proof; practice in critical reception as well as effective composition of persuasive discourse.

COM 319. THE RHETORICAL TRADITION.
Class 3, cr. 3.
A historical survey of major rhetorical theory as it relates to the development of Western civilization, with major emphasis on Aristotle and the "New Rhetoric."

COM 320. SMALL GROUP COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 114.
A study of group thinking and problem-solving methods; participation in and evaluation of committee and informal discussion groups.

COM 323. BUSINESS AND PROFESSIONAL SPEAKING.
Class 3, cr. 3.
Prerequisite: COM 114.
The study of oral communication problems and responsibilities in the business-organizational environment. Participation in problem-solving from investigation and informative speaking to advocacy and parliamentary debate.

COM 325. INTERVIEWING: PRINCIPLES AND PRACTICE.
Class 3, cr. 3.
Prerequisite: COM 114.
Theory and practice of methods in selected interview settings; informational, employment, and persuasive. Emphasis on communication between two persons, questioning techniques, and the logical and psychological bases of interpersonal persuasion.

COM 330. THEORIES OF MASS COMMUNICATION.
Class 3, cr. 3.
An examination of mass communication theories and theorists. Readings and discussion of McLuhan, Lippman, LaFleur, Lazarsfeld, Schramm, Stephenson, and other significant contributors.

COM 331. RADIO PRODUCTIONS.
Class 1, Lab. 4, cr. 3.
Prerequisite: COM 202.
Basic principles of producing, directing, and wiring for radio. Treats program types, production methods, techniques of the sound studio, principles of directing radio programs, and laboratory practice in production and direction.

COM 332. TELEVISION PRODUCTION.
Class 1, Lab. 4, cr. 3.
Prerequisite: COM 202, COM 254, and COM 331.
Basic principles of producing, writing, and directing for television. Production and direction of television programs at the Purdue Television Unit. Treats program types and television criticism, and explores creative treatment of visual, ARTISTIC, and nonverbal elements of communication in television.

COM 333. FILM PRODUCTION.
Class 2, Lab. 2, cr. 3.
Prerequisite: COM 250 and consent of instructor.
Basic theory and techniques of motion picture production. Viewing and evaluation of films illustrating a variety of film techniques.

Production experiences in filming, scripting, editing, sound recording, and production planning.

COM 334. JOURNALISM FOR THE ELECTRONIC MEDIA.
Class 2, Lab. 2, cr. 3.
Prerequisite: COM 202.
The development and practice of electronic journalism with projects relating to straight news, feature reports, commentary, editorial, interview, and documentary.

COM 335. MEDIA GRAPHICS.
Class 2, Lab. 2, cr. 3.
Prerequisite: Consent of instructor required.
Covers the design and production of electronic print graphics, including layout, composition, and printing.

COM 337. VIDEO PRODUCTION/EDITING.
Class 1, Lab. 4, cr. 3.
Prerequisite: COM 331 or COM 332 or consent of instructor.
Provides experience in writing program proposals and scripts, taping with small-format television equipment, audio equipment and on-line video editing for various program formats. Special attention to editing theory and technique, esthetic considerations, and institutional and community cable outlets.

COM 343. FUNDAMENTALS OF ORAL INTERPRETATION.
Class 2, Lab. 2, cr. 3.
Prerequisite: COM 114.
A study of basic theories of oral interpretation including the analysis and presentation of literature.

COM 344. ADVANCED INTERPRETATION: POETRY.
Class 2, Lab. 2, cr. 3.
Prerequisite: COM 343 or consent of the instructor.
Advanced theories and analytical concepts of interpretation dealing only with poetic literature.

COM 345. ADVANCED INTERPRETATION: PROSE.
Class 2, Lab. 2, cr. 3.
Prerequisite: COM 343, or equivalent.
Advanced theories and analytical concepts of interpretation dealing only with prose literature and focusing on dialogue and narration.

COM 346. ADVANCED INTERPRETATION: DRAMA.
Class 2, Lab. 2, cr. 3.
Prerequisite: COM 343, or equivalent.
Advanced theories and analytical concepts of interpretation dealing only with dramatic literature: the play, dialogue, monologue.

COM 350. INTERRACIAL COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 114 and consent of instructor.
Analysis of problems and solutions in interracial communication. Investigation of negative attitudes and other barriers impeding interethnic communication, especially between whites and blacks. Use of model communicative situations in interracial dialogue.

COM 352. MASS COMMUNICATION LAW.
Class 3, cr. 3.
Prerequisite: COM 202.
Study of Anglo-American traditions and trends, as well as current American conditions of the laws of libel, privacy, fair comment and criticism, privilege, property rights, and copyright as much factors affect the print journalist and the broadcaster. Emphasis is on existing state and federal regulations and precedents.

COM 353. PROBLEMS IN PUBLIC RELATIONS.
Class 3, cr. 3.
Prerequisite: COM 253.
Approaches to problems in public relations as they occur in industry, government, education, social agencies, and other institutions.

COM 355. FUNDAMENTALS OF ADVERTISING.
Class 3, cr. 3.
Prerequisite: COM 202 or 250.
Theory and practice of advertising in the mass media, with emphasis on the newspaper and the magazine.

COM 357. HIGH SCHOOL PUBLICATIONS.
Class 3, cr. 3.
Study of the functions, mechanics, and writing techniques of high school newspapers and yearbooks. A survey of editorials, business, and productions aspects of student publications with some news writing assignments. Instruction in teaching high school journalism. Recommended for prospective teachers of English.

COM 365. COMMUNICATION AND AGING.
Class 3, cr. 3.
Prerequisite: COM 114.
Study of communication with and among the elderly, within the contexts of family, social networks, and social and health providers. Effects of communication on the aged and the perception of aging will be discussed.

COM 371. HEALTH COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 114 or consent of instructor.
Exploration of the communication competencies needed by health care professionals (doctors, dentists, nurses, social workers, therapists, etc.) in the performance of their health care tasks. The course will emphasize helper-helpee interviewing, verbal and nonverbal skills, group interaction, intercultural communication, health care organizations, and therapeutic communication.

COM 405. THE RHETORIC OF WOMEN'S RIGHTS.
Class 3, cr. 3.
Prerequisite: COM 114.
An analysis of the major arguments and persuasive techniques used in the American women's movement and continuing through the current struggle for equal rights. Included will be major speeches as well as non-oratorical forms of rhetorical messages. (Same as WOST 405)

COM 415. DISCUSSION OF TECHNICAL PROBLEMS.
Class 3, cr. 3.
Prerequisite: COM 315.
Open only to students in the departments of Technology.
Principles of speech communication related to interpersonal and group discussions on technical topics and problems; practice in using these modes in situations typically encountered by the technologists.

COM 420. INTRODUCTION TO ORGANIZATIONAL COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 320.
Examination of the communication concepts and practices related to the function and success of organizations. Formal and informal channels will be analyzed on the basis of use source content, potency and trustworthiness. Readings and analyses will focus on goals, reliability and applicability appropriate of organizational settings. Types of organizations to be studied

will include industrial "giants," governmental agencies, social and educational administrative bodies, and formal task groups.

COM 425. RHETORICAL CRITICISM.
Class 3, cr. 3.
Prerequisite: COM 225.
A comparative study of the writings on traditional and contemporary rhetorical criticism. Students will have an opportunity to describe, analyze, interpret, and evaluate persuasive discourse.

COM 430. BROADCAST SALES.
Class 3, cr. 3.
Prerequisite: COM 202.
An examination of broadcasting time sales incorporating the study of the meaning and use of rating data, rate cards and advertising practices. Fund raising in public broadcasting will also be examined. Special emphasis on the use of sales tools and techniques.

COM 433. PRACTICUM IN FILM.
Class 1, Lab. 2, cr. 2.
Prerequisite: COM 333 and consent of instructor.
(May be repeated once only for credit.)
Assigned production in cinematography.

COM 434. PRACTICUM IN RADIO AND TELEVISION.
Class 1, Lab. 4, cr. 3.
Prerequisite: COM 331 and COM 332.
(May be repeated once only for credit.)
Assigned radio and television production.

COM 436. SCRIPT WRITING.
Class 3, cr. 3.
Prerequisite: COM 202.
Study of forms and materials suitable for the electronic mass media; practice in selection, adaptation, and organization of program materials.

COM 441. ADVANCED TELEVISION PRODUCTIONS.
Class 1, Lab. 4, cr. 3.
Prerequisite: COM 331, COM 332 and consent of instructor.
An emphasis on production of in-depth investigative reporting, documentaries, and community affairs programming. Students will produce, direct and edit programs which will be aired via cable or closed circuit.

COM 451. MAGAZINE JOURNALISM.
Class 3, cr. 3.
Prerequisite: COM 255 or consent of instructor.
Examination of magazine staff organization, market analysis, and editorial consent. Study of, and practice in, the writing of a variety of nonfiction materials for magazines. Emphasis is on the adaptation of topics and presentation of editorial policies and reader groups.

COM 452. PRACTICUM IN JOURNALISM.
Class 1, Lab. 2, cr. 2.
Prerequisite: COM 252 or 255 and consent of instructor.
(May be repeated for credit.)
Assigned projects in journalism.

COM 459. PUBLICATIONS EDITING.
Class 2, Lab. 2, cr. 3.
Prerequisite: COM 255 or consent of instructor.
Study of, and practice in the handling of graphic materials, and page makeup techniques. A variety of publication formats, including standard and tabloid pages, will be dealt with.

COM 460. ADVANCED PUBLIC RELATIONS.
Class 2, Lab. 2, cr. 3.
Prerequisite: COM 353.
Research design and implementation skills applied by students individually and in groups to actual business communication problems.

COM 490. INTERNSHIP IN COMMUNICATION.
Variable title, variable pattern, variable credit (1-6).
Prerequisite: COM 114, first course in area, junior or senior standing, consent of instructor.
(May be repeated up to a total of nine credit hours.)
Experiential, supervised training in one of the areas of specialization in communication. Students will work in an organization under supervision and are required to devote to the INTERNSHIP the number of hours per week which the organization supervisor and academic coordinator have established. Students will spend a minimum of five hours per week at the place of the internship. Students will be evaluated by the organization supervisor and the academic coordinator.

COM 491. SPECIAL TOPICS IN COMMUNICATION.
Variable pattern; variable credit, 1-6.

COM 508. NONVERBAL COMMUNICATION IN HUMAN INTERACTION.
Class 3, cr. 3.
Prerequisite: consent of instructor.
An examination of theoretical writings and nonverbal study-e.g., the environmental influences, space and territory relationships, physical behavior, and vocal cues. One unit will specifically concern itself with measurement, recording, or transcription methods used in nonverbal study.

COM 511. DEVELOPMENT AND DIRECTION OF FORENSIC PROGRAMS.
Class 3, cr. 3.
Intended primarily for advanced undergraduates and students pursuing master's degrees.
Admissions by consent of instructor.
Study of the philosophy and role of various forensic activities in speech education; recent trends and practices in co-curricular and extra-curricular programs; critical evaluation of related research.

COM 512. THEORIES OF INTERPERSONAL COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 214 or consent of instructor.
Review of contemporary theories, analysis of concepts, models, and pertinent research across the broad spectrum of interpersonal communication.

COM 515. PERSUASION IN SOCIAL MOVEMENTS.
Class 3, cr. 3.
Prerequisite: COM 318 or by consent of instructor.
A study of the concept of persuasion in social movement theory and the role rhetoric has played historically in selected social movements such as suffrage, women's liberation, civil rights, evangelism, and trade unionism.

COM 517. COMMUNICATION IN POLITICS.
Class 3, cr. 3.
Prerequisite: COM 318 or consent of instructor.
Development and application of critical standards to the rhetoric employed by candidates for public office. Study of the campaign strategies employed by parties and their candidates at various levels of government.

COM 518. THEORIES OF PERSUASION.
Class 3, cr. 3.
Prerequisite: COM 318 or consent of instructor.
Review of contemporary theories, including analysis of concepts, models, and pertinent research across the broad spectrum of persuasive communication.

COM 520. SMALL GROUP COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 320 or consent of instructor.
Survey and critical evaluation of theoretical and empirical literature dealing with human communication within small group settings.

COM 521. THEORIES OF RHETORIC.
Class 3, cr. 3.
Prerequisite: COM 318 or consent of instructor.
A comprehensive survey of the principle figures, theories, and movements in rhetoric from the classical era to the present.

COM 525. ADVANCED INTERVIEWING AND CONFERENCE METHODS.
Class 3, cr. 3.
Prerequisite: COM 325 or equivalent.
Application of modern communication theory to interview situations, with emphasis upon problems involving superior-subordinate relations, information-getting, and interpersonal misunderstanding. Classroom demonstrations based upon real-life cases supplemented by off-campus interviews; practice in briefing techniques.

COM 531. SPECIAL TOPICS IN MASS COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 250 and consent of the instructor.
Critical analysis and evaluation of current and continuing problems in both commercial and public mass communication.

COM 532. TELECOMMUNICATION SYSTEMS MANAGEMENT.
Class 3, cr. 3.
Prerequisite: COM 202 or consent of the instructor.
A study of problems of organization and management of radio and television stations-both commercial and public-with emphasis upon economic factors as well as on the interrelationships of various departments. Special problems related to programming, production, sales, public relations, CATV, audience, governmental regulation, current and future trends will be treated.

COM 533. DOCUMENTARY TELEVISION.
Class 1, Lab. 4, cr. 3.
Prerequisite: COM 441 and consent of instructor.
Advanced theory and techniques in the production of documentary television. Viewing and evaluation of representative television documentaries, as well as experience in producing short documentary programs.

COM 534. COMPARATIVE TELECOMMUNICATION SYSTEMS.
Class 3, cr. 3.
Prerequisite: COM 250 or consent of instructor.
Historical, sociological, and political aspects of various systems of broadcasting throughout the world. Examination of American, Canadian, British, French, German, Soviet, and other broadcast institutions to discover why and how they are regulated and what impact they have on political, social, and economic development.

COM 536. RADIO AND TELEVISION WRITING.
Class 3, cr. 3.
Prerequisite: COM 202 or consent of instructor.
Study of forms and materials suitable for both media; practice in selection, adaptation, and organization of special program materials; special uses of media in education.

COM 537. EDUCATIONAL/INSTITUTIONAL TELEVISION.
Sem. 1. SS.
Class 3, cr. 3.
Admission by consent of instructor.
Survey of the educational and instructional applications of radio and television materials; analysis of selected problems in the educational uses of the media; analysis and application of production practices as related to the learning process.

COM 540. ADVANCED ORAL INTERPRETATION.
Class 3, cr. 3.
Prerequisite: COM 240 or equivalent.
Study and practice of the techniques of oral interpretation for public performances. Emphasis on analysis of materials, program building, and criticism. Consideration also given to utilizing oral reading techniques in the teaching of literature and speech at the secondary level.

COM 541. ENSEMBLE INTERPRETATION.
Class 3, cr. 3.
Prerequisite: COM 240 or equivalent.
A study of the history, theories, and styles of group oral presentation of literature including fictional, dramatic, non-fictional, and thematic subjects. Emphasis is placed on experimentation in the styles of presentation and on the development of analytical insights into various literary forms.

COM 545. THEORIES OF ORAL INTERPRETATION.
Class 3, cr. 3.
Prerequisite: a course in oral interpretation, or consent of instructor.
A study of the theories of oral interpretation of literature that have emerged from the classical period of Greece and Rome to the present. Emphasis on the influence of leaders in the field during the eighteenth, nineteenth, and twentieth centuries.

COM 559. CURRENT TRENDS IN MASS COMMUNICATION RESEARCH.
Class 3, cr. 3.
Prerequisite: COM 330 or consent of instructor.
An examination of current research as it contributes to understanding the process and effects of mass communication. Topics covered include gatekeepers and information control, audience selection processes and uses, media content and social learning, the effects of adults programming on children, and the effects of the media on the governmental process.

COM 560. RHETORICAL DIMENSION OF MASS MEDIA.
Class 3, cr. 3.
Prerequisite: COM 521 or consent of instructor.
A study of the ways in which rhetorical elements and processes are embodied in and modified by the media of mass communication. The rhetorical functions of print and electronic media are examined individually as well as within the context of specific campaigns and movements.

COM 574. ORGANIZATIONAL COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 420 or consent of instructor.

Survey of the theoretical and empirical literature dealing with human communication behavior as it occurs within the context of complex organizations. Among topics covered are superior-subordinate communication, communication networks, message distortion, feedback processes, conflict management, semantic and stylistic dimensions of messages, and communication in decision making.

COM 582. DESCRIPTIVE/EXPERIMENTAL RESEARCH IN COMMUNICATION.
Class 3, cr. 3.
Admission by consent of instructor. (May be repeated for credit.)
Introduction to modes of quantitative search in communication, including problem formulation, basic measurement concepts, elementary methods of data collection and analysis, and basic designs for descriptive and experimental research, individual and/or group research projects are planned, conducted and reported.

COM 583. RESEARCH AND ASSESSMENT IN ORGANIZATIONAL COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 574 and COM 582.
An overview of applied research methodologies in organizational communication, the course focuses on the design of field investigations and the use of self-report measures, network analysis, and interviewing in organizational communication research. These general methodologies are applied to specific research approaches.

COM 584. HISTORICAL/CRITICAL RESEARCH IN COMMUNICATION.
Class 3, cr. 3.
Admission by consent of instructor. (May be repeated for credit.)
Introduction to modes of qualitative research in communication, including theoretical assumptions, bibliographical methods, varying approaches to historical and critical inquiry, and the standards and techniques of scholarly writing.

COM 590. DIRECTED STUDY OF SPECIAL PROBLEMS.
Cr. 1-3.
Admission by consent of instructor only.
(May be repeated for credit.)

COM 612. SEMINAR: SPECIAL TOPICS IN INTERPERSONAL COMMUNICATION.
Class 3, cr. 3.
Prerequisite: COM 512 or consent of instructor. (May be repeated for credit.)
Intensive study of selected topics varying from semester to semester, from the theoretical and research literature of interpersonal communication. Topics may include communication models, information theory, systems theory, general semantics, sociolinguistics, etc., as they relate to the study of interpersonal communication.

COM 621. SEMINAR: SPECIAL TOPICS IN RHETORICAL THEORY.
Class 3, cr. 3.
Prerequisite: COM 521 or consent of instructor. (May be repeated for credit.)
Intensive study of selected topics, varying from semester to semester, from the literature of rhetorical theory.

COM 632. SEMINAR: SPECIAL TOPICS IN MASS COMMUNICATION.
Class 3, cr. 3.
Admission by consent of instructor. (May be repeated for credit.)
Intensive study of selected topics, varying from semester to semester, from the literature of mass communication. Topics may include institutional analysis, mass communication law, information diffusion, uses of mass communication, or other issues.

COM 674. SEMINAR: SPECIAL TOPICS IN ORGANIZATIONAL COMMUNICATION.
Class 3, cr. 3.
Admission by consent of instructor. (May be repeated for credit.)
Intensive study of selected topics, varying from semester to semester, from the theoretical and research literature of organizational (including business and industrial) communication; analysis of recurring communication problems in complex organizations; critique of research findings and methodologies.

COM 698. RESEARCH M.A. or M.S. THESIS.

COMPUTER SCIENCE

CS 091. COOPERATIVE WORK EXPERIENCE 1.
Cr. 0.
Prerequisite: Must be accepted for program by coordinator.
For Cooperative Education Program students only.

CS 092. COOPERATIVE WORK EXPERIENCE 2.
Cr. 0.
Prerequisite: CS 091.

CS 093. COOPERATIVE WORK EXPERIENCE 3.
Cr. 0.
Prerequisite: CS 092.

CS 094. COOPERATIVE WORK EXPERIENCE 4.
Cr. 0.
Prerequisite: CS 093.

CS 095. COOPERATIVE WORK EXPERIENCE 5.
Cr. 0.
Prerequisite: CS 094.

CS 171. FORTRAN.
Class 4, cr. 4.
Prerequisite: Previous programming experience and completion of MA 151 with C or better.
This course will cover the following topics: Basic concepts, basic instructions, transfer of control, do loops, arrays and subscripted variables, subprograms, advanced data types, advanced features of subprograms and arrays, files, and modeling and simulation. At least five programs illustrating one or more elementary concepts and at least two programs of significant length and difficulty will be required.

CS 191. PASCAL.
Class 4, cr. 4.
Corequisite: MA 163 with C or better.
This course will cover the following topics: Introduction to computers, scalar data types, basic instructions, subprograms, flow control statements, structured data types, recursion, external subprograms, and dynamic variables. At least five programs illustrating one or more elementary concepts and at least two programs of significant length and difficulty will be required.

CS 215. NUMERICAL ANALYSIS I.
Class 3, cr. 3.
Prerequisite: MA 221 and a programming language with C or better.
Numerical methods for the solution of mathematical problems and the analysis of tabulated data. Emphasis is on the solution of specific problems by use of computers.

CS 241. ASSEMBLY LANGUAGE PROGRAMMING.
Class 4, cr. 4.
Prerequisite: CS 191 with C or better.
Assembly language programming and structure of a typical computer. Number and character representation. Pseudo operations, macros, and input/output. Interfacing with programs written in a higher level language, parameter passing, and common storage. Organizing and debugging programs.

CS 275. DATA STRUCTURES.
Class 3, cr. 3.
Prerequisite: CS 241 or equivalent with C or better.
Specification, representation, and manipulation of basic data structures; linked lists, arrays, stacks, queues, trees, strings, symbol tables, Huffman codes, optimal search trees, pattern matching, priority queques, heaps, hash tables. Storage allocation, garbage collection, compaction, reference counts. List and string processing languages. Analysis of algorithms. Students are required to write programs in several languages.

CS 301. LANGUAGE COMPETENCY.
Class 0, cr. 1.
Prerequisite: CS 191 or CS 171 and CS 241 passed with C or better.
A course intended to give the student experience in an additional high-level language. Each section of this course is the responsibility of a particular faculty member who will advise the student and assign programming projects. A student may receive credit for at most three of these sections, but for no section whose language was a major component of a course for which credit has already been attained. Various languages will be offered each semester.

CS 315. NUMERICAL ANALYSIS II.
Class 3, cr. 3.
Prerequisite: CS 215 and MA 222 with C or better.
A continuation of CS 215. Topics covered include: finite difference calculus and applications, differentiation techniques, and error analysis applied to these techniques.

CS 401. ARCHITECTURE OF COMPUTERS.
Class 3, Lab. 2, cr. 4.
Prerequisite: CS 241 with C or better.
Prerequisite or corequisite: Physics 251 or Physics 261 or EET 102. Approval of electrical circuit knowledge gained in other ways may be sought from the instructor.
Concepts of computer systems and hardware organizations, processor organization, instruction forms and addressing modes, including microprogramming. Operation code design and automatic error correction. Real and virtual memory structures, paging and interrupts. Vector and array processors. Emphasis is on high-level organization of subsystem components.

CS 405. INTRODUCTION TO OPERATING SYSTEMS.
Class 3, cr. 3.
Prerequisite: CS 275 or consent of instructor with C or better.
An introduction to the terminology and basic concepts of operating systems. Topics will include: multiprogramming, multiprocessors, CPU scheduling algorithms, page replacement algorithms, deadlock, concurrent processes, virtual memory operating systems, security and network topologies.

CS 414. INTRODUCTION TO NUMERICAL ANALYSIS.
Class 3, cr. 3.
Prerequisite: MA 261, CS 171, or CS 191 with C or better.
Iterative methods for solving nonlinear equations; direct and iterative methods for solving linear systems; approximations of functions, derivatives and integrals; error analysis.

CS 425. PROGRAMMING LANGUAGES.
Class 3, cr. 3.
Prerequisite: CS 275 with C or better.
The study of the inter-relationships between the parts of a programming language. The design goals and motivations for various languages will be discussed. Topics will include a comparison of block structured languages, list processing languages, functional programming languages and logic programming languages. Specific examples of each type of language and its advantages and disadvantages will also be included.

CS 440. FILE STRUCTURE AND SEARCH.
Class 3, cr. 3.
Prerequisite: CS 171 or CS 191 and CS 275 with C or better.
This course provides the basic concepts of data structures, file organizations, and data base management systems. The various data structures particularly relevant to file management are studied along with several important file organization and access techniques. Finally, the major concepts of data base management systems are covered, including: data models, data definition and manipulation languages, and high-level query languages.

CS 455. INTERACTIVE COMPUTER GRAPHICS.
Class 3, Lab. 2, cr. 4.
Prerequisite: MA 261 and CS 275 with C or better.
The principles of computer graphics and interactive graphical methods for interdisciplinary problem solving. Design aspects and consideration of several classes of graphics systems. Laboratory projects.

CS 462. INTRODUCTION TO ARTIFICIAL INTELLIGENCE.
Class 3, cr. 3.
Prerequisite: CS 275 with C or better.
This course will cover the following topics: Problems and problem spaces, heuristic search, forward and backward reason, breadth-first vs. depth-first search, and/or graphs, conversion to clause form and resolution. A brief introduction to LISP programming will also be included.

CS 480. THE PRACTICUM IN APPLIED MATHEMATICS.
(See MA 480.)

CS 482. DISCRETE COMPUTATIONAL STRUCTURES.
Class 3, cr. 3.
Prerequisite: MA 262 with C or better.
Finite and discrete mathematical structures relating to the theory of computers. Directed and undirected graphs and their relation to these structures. Combinatorial problems inherent in computation. Introduction to mathematical analysis of algorithmic complexity.

CS 484. THEORY OF COMPUTATION.
Class 3, cr. 3.
Prerequisite: CS 482 or MA 453 with consent of instructor, with C or better.
Examples of various mathematical models for algorithmic processes; finite automata. Turing machines, formal language theory. Algebraic and graphical representation of these and other models.

CS 490. TOPICS IN COMPUTER SCIENCES FOR UNDERGRADUATES.
Cr. 1-5.
Supervised reading and reports in various fields. Open to students only with the consent of the department.

CS 490S. COMPILING AND PROGRAMING SYSTEMS.
Class 3, cr. 3.
Prerequisite: CS 275, CS 241, CS 401 with C or better.
Basic principles of compilers and compiler design; control of translation, loading and execution; symbolic coding systems; lexical and syntactic analysis, design and operation of assemblers and macroprocessors; design of interpretive systems.

CS 514. NUMERICAL ANALYSIS.
Class 3, cr. 3.
Prerequisite: CS 414 with C or better.
Iterative methods for solving nonlinear equations; linear difference equations, applications to solution of polynomial equations; differentiation and integration formulas; numerical solution of ordinary differential equations; roundoff error bounds.

CS 515. NUMERICAL ANALYSIS OF LINEAR SYSTEMS.
Class 3, cr. 3.
Prerequisite: MA 352; corequisite: CS 171 or CS 191 with C or better.
Computational aspects of linear algebra; linear equations and matrices; error analysis.

CS 590. TOPICS IN COMPUTER SCIENCES.
Class 1-5, cr. 1-5.
Directed study for students who wish to undertake individual reading and study on approved topics.

ECONOMICS

ECON 210. PRINCIPLES OF ECONOMICS.
Class 3, cr. 3.
Study of the basic economic institutions and the role they play in defining and achieving the nation's economic goals. Emphasis will be placed on the interdependent nature of the economy and the effects of economic decisions on the individual and society.

ECON 240. PERSONAL FINANCIAL MANAGEMENT.
Class 3, cr. 3.
(Credit will only be given for one of the following: ECON 240, MGMT 240 or MGMT 442.)
Lectures and case analysis of managing one's personal finances; including budgeting, credit analysis, insurance, taxation, housing, estate planning, private and business investment. Not available for credit in Management concentrations.

ECON 251. MICROECONOMICS.
Class 3, cr. 3.
Prerequisite: MA 125 or equivalent.
Price theory and resource allocation. Emphasis is on developing a detailed understanding of the principles of microeconomics and analysis and their application to understanding price and market behavior.

ECON 252. MACROECONOMICS.
Class 3, cr. 3.
Prerequisite: ECON 251 and MA 126 or equivalent.
Analysis of the forces affecting national income, employment, interest rates, and the price level. Emphasis is placed upon the role of government fiscal and monetary policy in achieving full employment and stable prices.

ECON 351. INTERMEDIATE MICROECONOMICS.
Class 3, cr. 3.
Prerequisite: ECON 252.
Theoretical treatment of consumer and producer behavior. Analysis of demand, production, cost, product and factor markets leading to general equilibrium and welfare implications. Emphasis is upon the development of skills necessary to analyze the behavior of individual economic agents.

ECON 352. INTERMEDIATE MACROECONOMICS.
Class 3, cr. 3.
Prerequisite: ECON 252.
Macroeconomic behavior. The determinants of consumption, investment, and the aggregate demand for assets, The joint determination of income, the price level, and the rate of interest. The role of government. Elements of economic growth.

ECON 353. BUSINESS CYCLES.
Class 3, cr. 3.
Prerequisite: ECON 252.
This course provides an analysis of business fluctuation and the impact of government policy instruments. Special emphasis is placed on how macroeconomic factors influence managerial and personal decision making.

ECON 360. ECONOMETRICS.
Class 3, cr. 3.
Prerequisite: MGMT 305.
This course provides an analysis of regression and problems encountered in utilizing regression analysis. Emphasis is placed on diagnosing common empirical problems, selecting the most appropriate approach and interpreting the results. This course will utilize examples from the fields of finance and marketing as well as economics.

ECON 375. UNITED STATES ECONOMIC HISTORY.
Class 3, cr. 3.
Prerequisite: ECON 251 or equivalent.
A study of the growth of the American economy from colonial times to the late nineteenth century. Emphasis is placed on the application of the tools of economic analysis to historical questions concerning the sources and rate of growth, the relationships between growth and structural and institutional change, and the impact of industrialization of the quality of life in the American economy.

ECON 415. CONTEMPORARY ECONOMIC PROBLEMS AND POLICIES.
Class 3, cr. 3.
Prerequisite: ECON 251.
A study of economic policies designed to improve the attainment of economic goals. Emphasis is placed on the examination of the relationship between private decision making and public policy in such areas as health care, trans-

portation, environmental protection, and income distribution.

ECON 419. MANAGERIAL ECONOMICS.
Class 3, cr. 3.
Prerequisite: ECON 251.
The application of economic analysis and common nonmathematical models to concrete business decisions, such as capital acquisition and replacement, optimum inventory, and pricing. Linear programming is considered.

ECON 425. GOVERNMENT AND BUSINESS.
Class 3, cr. 3.
Prerequisite: ECON 351.
Basic problems of governmental control and regulations of business, with emphasis on regulation through administrative agencies, taxation and fiscal policy, and the antitrust laws.

ECON 434. INTERNATIONAL TRADE.
Class 3, cr. 3.
Prerequisite: ECON 252.
Comparative advantage (why countries trade). The effects of tariffs, customs unions (the Common Market). The balance of payments.

ECON 462. THE ECONOMICS OF HEALTH CARE.
Class 3, cr. 3.
Prerequisite: Junior or Senior standing, or consent of instructor.
The course analyzes economic forces that shape the health care industry. Course content includes the market structure of the health care industry, public and private health care delivery systems, reimbursement methods for services, and the labor market for health care workers.

ECON 465. ECONOMIC FORECASTING TECHNIQUES.
Class 3, cr. 3.
Prerequisite: MGMT 225.
Not open to students with credit in MGMT 465.
A course examining the statistical techniques of forecasting. Emphasis is placed on economic time-series data and computer based methods of estimation and testing.

ECON 490. PROBLEMS IN ECONOMICS.
Cr. 1-4.
Supervised reading and reports in various subjects. Open only to a limited number of seniors with superior records in previous courses. Arrange with instructor before enrolling.

ECON 513. ECONOMIC THEORY.
Class 3, cr. 3.
For students in the management graduate programs.
Theoretical analysis of a market economy with an emphasis on decision processes of managers. Consideration is given to micro aspects of price determination, utilization of resources and market organization, and to aggregative concepts of national income and employment.

ECON 525. GOVERNMENT AND THE ECONOMY.
Class 3, cr. 3.
Graduate standing.
(Not open to students with credit in ECON 425.)
Problems of government antitrust and regulation theory and practice. Particular attention is given to firm behavior in unregulated markets and the modifications of this behavior which result from government intervention.

ECON 530. MONEY AND FINANCE.
Class 3, cr. 3.
Must be preceded by ECON 252, graduate standing, or consent of instructor.
Analysis of financial policies and policymaking. Policymakers include the Federal Reserve, the Treasury, federally sponsored credit agencies, and the Congress through its legislative initiatives. Both the macroeconomic (inflation and unemployment) and sectoral (housing and state and local outlays versus business outlays) impacts of a wide variety of policies and legislation are considered.

ECON 534. INTERNATIONAL TRADE THEORY.
Class 3, cr. 3.
Graduate standing.
(Not open to students with credit in ECON 434 and/or 466.)
Study of the modern theory of the balance of payments, factor price equalization, the terms of trade equalization, and the theory of custom unions.

ECON 560. THE ECONOMICS OF HEALTH.
Class 3, cr. 3.
Must be preceded by ECON 251.
The course is a microeconomic study of the allocation of resources to the health industry. Special characteristics of the industry include the mixture of profit and non-profit firms. Topics investigated are the supply and demand for health services such as physician, hospital, and nursing care.

ECON 586. THE UNITED STATES AND THE WORLD ECONOMY IN RECENT TIMES.
Class 3, cr. 3.
Must be preceded by ECON 251, 252 or graduate standing.
An economic history of the United States, Europe, and Japan in the twentieth century. Attention is given to the economic consequences of the World Wars, to the interwar depression, and to the postwar growth of the developed economics.

EDUCATION, CURRICULUM AND INSTRUCTION

EDCI 200. TEACHING AND LEARNING SEMINAR; ELEMENTARY I.
Class 1, cr. 0.
A seminar under the leadership of an instructor who also serves as the professional advisor. Students discuss and explore those ideas, techniques and concepts related to teacher preparation. Identification and clarification of students' personal and professional needs with emphasis on the integration of the learning experiences into meaningful total program. Elementary majors must enroll in each of the four semesters beginning with the sophomore level. Credit is assigned only in EDCI 201 and EDCI 301.

EDCI 201. TEACHING AND LEARNING SEMINAR: ELEMENTARY II.
Class 1, cr. 1.
Continuation of the seminar sequence. See EDCI 200.

EDCI 203. TEACHING AND LEARNING SEMINAR: SECONDARY I.
Class 1, cr. 1.
A seminar under the leadership of an instructor who also serves as the students' professional advisor. Students discuss and explore those ideas, techniques and concepts related to teacher preparation. Identification and clarification of students' personal and professional needs with emphasis on the integration of the learning experiences into meaningful total program.

EDCI 212. INTRODUCTION TO EARLY EDUCATION.
Class 3, cr. 3.
Reviews history and philosophy of kindergartens and other programs for young children. Classroom organization and management alternatives are analyzed. Emphasis is placed on meeting individual needs of young children through group and individual activities.

EDCI 214. TUTORIAL ASSISTANCE TRAINING.
Class 2, Lab. 2, cr. 3.
Designed to provide the skills and procedures necessary for an effective teaching-learning experience on a one-to-one basis. Focus will be upon the types of cognitive and affective skill development needed by the professional or paraprofessional in a tutor-teaching role. Competency in the content area(s) is assumed.

EDCI 241. GENERAL STRATEGIES FOR INSTRUCTIONS.
Class 3, Lab. 2, cr. 4.
Prerequisite: EDPS 220.
Acquaints students with general methods and materials for teaching at various levels. Fundamental principles of classroom management and planning of instructional units. Field experiences are integrated with classroom instruction. (Not a substitute for methods courses in 4-year teacher education program.)

EDCI 300. TEACHING AND LEARNING SEMINAR: ELEMENTARY III*.
Class 1, cr. 0.
Continuation of the seminar sequence. See EDCI 200.

EDCI 301. TEACHING AND LEARNING SEMINAR: ELEMENTARY IV*.
Class 1, cr. 1.
Continuation of the seminar sequence. See EDCI 200.

EDCI 303. TEACHING AND LEARNING SEMINAR: SECONDARY II. *
Class 1, cr. 1.
Continuation of the seminar sequence. See EDCI 203.

EDCI 306. TEACHING READING IN THE ELEMENTARY SCHOOL. *
Class 3, cr. 3.
Methods and materials for teaching reading in the elementary school. Suggests a diagnostic-prescriptive approach from reading readiness through the development of word attack and comprehension skills and includes strategies for incorporating literature and reading of content subjects. Provision for individual and cultural differences stressed. Appropriate field experiences are provided.

EDCI 307. CORRECTIVE READING FOR THE CLASSROOM TEACHER. *
Class 2, Lab. 3, cr. 3.
Prerequisite: EDCI 306 or EDCI 309.
Classroom procedures for the identification of reading difficulties; selection and application of appropriate methods and materials to provide corrective treatment. Emphasizes approaches to discovering and diagnosing reading; techniques for selecting materials in planning a remedial program, methods for teaching specific skills and techniques for evaluating progress. Appropriate laboratory and field experiences are provided.

EDCI 308. PRACTICUM IN READING FOR THE CLASSROOM TEACHER. *
Class 1, Lab. 4, cr. 3.
Prerequisite: EDCI 307.
The course is designed for prospective teachers in elementary or secondary schools who desire advanced supervised practice in teaching reading to pupils experiencing reading difficulty. It is required for a minor in reading. The practicum will provide extended diagnostic and teaching experiences in a wide range of reading settings. The seminar will evaluate diagnostic and tutoring strategies, methods, materials, and achievement.

EDCI 309. READING IN MIDDLE AND SECONDARY SCHOOLS: METHODS AND PROBLEMS. *
Class 3, cr. 3.
A course for prospective secondary teachers. Emphasis placed on techniques and strategies of teaching reading in secondary classrooms and incorporation of reading skills in the various content areas. Attention is given to teaching reading skills and providing for students of varying reading abilities. Provision for simulated activities, field experiences and observations.

EDCI 311. MEDIA FOR CHILDREN.
Class 3, cr. 3.
Books, films, filmstrips, records, magazines and other resources provided in elementary media centers are studied and evaluated to meet the personal and educational needs of pupils in elementary schools. Emphasis in on wide reading of children's books and viewing of many media and their utilization with children.

EDCI 312. THE EARLY EDUCATION PROGRAM: COGNITIVE AREAS.
Class 2, Lab. 2, cr. 3.
Prerequisite: EDCI 212.
Presentation of various techniques for beginning academic learning through language arts, social studies, math, science, and the arts for preschool and kindergarten.

EDCI 313. THE EARLY EDUCATION PROGRAM: SOCIAL AND EMOTIONAL AREAS.
Class 2, Lab. 2, cr. 3.
Prerequisite: EDCI 212.
Reviews the building of socialization skills. Emphasis is on dealing with feelings, expressing emotions, developing attitudes and self-concept. Explores parent-teacher cooperation.

EDCI 329. TEACHING LANGUAGE ARTS AND SOCIAL STUDIES IN THE ELEMENTARY SCHOOL. *
Class 3, Lab. 3, cr. 4.
Not open to students with credit in EDCI 314 and 316.
Curriculum principles and objectives, organization and utilization of methods, materials and media and evaluation procedures in language arts and social studies instruction. Included are fundamental principles of classroom management and individualization of instruction to meet intellectual, ethnic and cultural development and needs of elementary students. Field experiences are integrated with classroom activities.

EDCI 330. TEACHING MATHEMATICS AND SCIENCE IN THE ELEMENTARY SCHOOL. *
Class 2, Lab. 6, cr. 4.
Not open to students with credit in EDCI 315 and 317.
Prerequisites: MA 135, MA 136.
Materials and methods in teaching science and mathematics at elementary levels. Field experiences are integrated with classroom activities.

* Undergraduate students may not enroll in any of these undergraduate courses until they have been admitted to teacher education and have a copy of acceptance on file in the Teacher Education Services Office.

EDCI 337. THEORY AND HISTORY OF BILINGUAL/BICULTURAL EDUCATION.
Class 3, cr. 3.
This course will provide the student with an overview of bilingualism and will introduce him/her to the bilingual setting in the schools with bilingual programs.

EDCI 340. METHODS AND MATERIALS IN TEACHING VISUAL ARTS AND CRAFTS AT MULTI-LEVELS IN INSTRUCTION. *
Class 2, Lab. 2, cr. 3.
Evaluation, selection and utilization of art materials and techniques used in the instructional program. Field experiences will provide a supportive, practical base.

EDCI 341. ENGLISH TEACHING IN SENIOR HIGH, JUNIOR HIGH, AND MIDDLE SCHOOLS. *
Class 1, Lab. 3, cr. 2.
Prerequisite: EDPS 220, prerequisite or corequisite: EDCI 355.
Acquaints students with methods and materials for teaching English in secondary schools. Includes and overview of the role of the English teacher today, a brief survey of the development of English as a school discipline, and planning of instructional units. Field experiences are integrated with classroom instruction.

EDCI 342. STRATEGIES OF FOREIGN LANGUAGE INSTRUCTION IN SENIOR HIGH, JUNIOR HIGH, AND MIDDLE SCHOOLS. *
Class 1, Lab. 3, cr. 2.
Prerequisite: EDPS 220, prerequisite or corequisite: EDCI 355.
Acquaints students with methods and materials for teaching foreign language both as a language experience and as a cultural experience. Comparative studies of various language teaching methods and an analysis of current foreign language textbooks are included. The use of audio-visual materials and equipment are stressed, including the appropriate use of the language laboratory. Field experiences are integrated with classroom instruction.

EDCI 344. STRATEGIES OF MATHEMATICS INSTRUCTION IN SENIOR HIGH, JUNIOR HIGH, AND MIDDLE SCHOOLS. *
Class 1, Lab. 3, cr. 2.
Prerequisite: EDPS 220, prerequisite or corequisite: EDCI 355.
Materials and methods in teaching mathematics in the secondary school. Field experiences are integrated with classroom instruction.

EDCI 346. STRATEGIES OF SCIENCE INSTRUCTION IN SENIOR HIGH, JUNIOR HIGH, AND MIDDLE SCHOOLS. *
Class 1, Lab. 3, cr. 2.
Prerequisite: EDPS 220, prerequisite or corequisite: EDCI 355.
Materials and methods in teaching science in the secondary school (includes Biology, Chemistry, Physics and General Science). Field and laboratory experiences are integrated with classroom instruction.

EDCI 347. STRATEGIES OF SOCIAL STUDIES INSTRUCTION IN SENIOR HIGH, JUNIOR HIGH, AND MIDDLE SCHOOLS. *
Class 1, Lab. 3, cr. 2.
Prerequisite: EDPS 220, prerequisite or corequisite: EDCI 355.
Acquaints students with materials and literature relating to the social studies field generally and the primary teaching area particularly. Methods of applying the principles of teaching in a social studies setting are emphasized through classroom simulations and field experiences.

EDCI 348. STRATEGIES OF SPEECH AND THEATER INSTRUCTION IN SENIOR HIGH, JUNIOR HIGH, AND MIDDLE SCHOOLS. *
Class 1, Lab. 3, cr. 2.
Prerequisite: EDPS 220, prerequisite or corequisite: EDCI 355.
Focuses on specific teaching methods, materials, subject matter content, and resources appropriate for speech and theater instruction at the secondary level. A field experience component will be required.

EDCI 355. TEACHING AND LEARNING IN THE SENIOR HIGH, JUNIOR HIGH, AND MIDDLE SCHOOL. *
Class 2, cr. 2.
Prerequisite: EDFA 101, EDPS 220, Admission to Teacher Education.
Acquaints students with general methods of promoting the learning process in the secondary school. Topics studied will include long-term and short-term instructional planning and evaluation; classroom organization including management, motivation of students, the use of media to promote instructional objectives; and individual and group learning procedures. Students will also study how curriculum goals are adapted and implemented in the secondary classroom.

EDCI 437. METHODS FOR TEACHING IN A BILINGUAL/BICULTURAL SETTING. *
Class 2, Lab. 2, cr. 3.
This course stresses the skills the student-teacher will need in dealing with a bilingual child. One half of the course will be devoted to a teaching laboratory. This teaching experience will take place in school systems with a bilingual program.

EDCI 490. INDIVIDUAL RESEARCH AND TEACHING EXPERIENCE.
Cr. 1-4.
Prerequisite: Consent of department.
Opportunity for undergraduate students to investigate particular problems in the field of education under supervision.

EDCI 491. TOPICS AND ISSUES IN EDUCATION.
Class 1, cr. 1.
Provides the student with the opportunity to strengthen the preparation program though the study of selected educational topics and issues based on individual needs and interests. One topic is dealt with in each enrollment.

EDCI 498A. SUPERVISED TEACHING IN THE ELEMENTARY SCHOOL.*
Cr. 9.
Ten weeks of full-time student teaching in elementary school classrooms under the supervision of the elementary education staff and public school teachers. Emphasis on preparation and presentation of major teaching units and full classroom responsibility.

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* Undergraduate students may not enroll in any of these undergraduate courses until they have been admitted to teacher education and have a copy of acceptance on file in the Teacher Education Services Office.

EDCI 498B. SUPERVISED TEACHING OF SECONDARY SCHOOL SUBJECTS. *
Cr. 9.
Ten weeks of full-time student teaching in some academic subject or physical education in secondary schools under the supervision of the public school teachers in charge of the high school classes and supervisors from the University.

EDCI 498S. SUPERVISED TEACHING: ALL GRADE EDUCATION. *
Cr. 9.
Ten weeks of full-time student teaching in media sciences in an elementary or secondary school under the supervision of a public school teacher and an appropriate university staff person.

EDCI 499A. SUPERVISED TEACHING OR PRACTICUM: LEARNING DISABILITIES. *
Cr. 4.
Observation and teaching of the student with learning disabilities under the supervision of a public school teacher and a university supervisor.

EDCI 499B. SUPERVISED TEACHING OR PRACTICUM: KINDERGARTEN. *
Cr. 3.
Observing and teaching in Kindergarten classes under the supervision of university staff and public school teachers.

EDCI 499D. SUPERVISED TEACHING OR PRACTICUM: JUNIOR HIGH/MIDDLE SCHOOL. *
Cr. 3.
Observation and teaching of a subject in a junior high-middle school under the supervision of a public school teacher and a university supervisor.

EDCI 500. FOUNDATIONS OF LITERACY.
Class 3, cr. 3.
Survey course in the acquisition of and instruction in reading, writing, and other aspects of language.

EDCI 501. PROBLEMS IN LITERACY ACQUISITION: EVALUATION AND INSTRUCTION.
Class 2, Lab. 3, cr. 3.
Prerequisite: EDCI 500, or concurrent enrollment or consent of instructor.
Examines informal and standardized instruments useful for evaluating students who experience difficulties acquiring reading, writing, and other aspects of language. Discusses corrective/remedial instructional strategies appropriate for the classroom and clinic. Supervised practicum.

EDCI 502. READING IN MIDDLE AND SECONDARY SCHOOLS.
Class 3, cr. 3.
Must be preceded by 12 hours of education or psychology.
A course designed for teachers and prospective teachers in subject matter areas of the junior and senior high school May be taken as part of the sequence leading to Reading Specialist of or for the Junior High-Middle School endorsement program. Surveys of techniques and objectives of reading instruction in the schools with special attention to the opportunities and obligations to teach reading within content areas. Teaching experience helpful but not required.

EDCI 504. CHILDREN'S LITERATURE.
Class 3, cr. 3.
Must be preceded by junior standing.
A survey of modern and traditional literature for children including authors and illustrators; guidance in uses of children's literature in relation to developmental interests, needs and skills of children; emphasis is on evaluating materials, reviewing sources and developing discrimination in choosing children's literature. This course is designed for beginning graduate students who plan to be school library/media specialists, but is available for classroom teachers.

EDCI 560. MICROCOMPUTER APPLICATIONS FOR EDUCATION AND TRAINING.
Class 3, cr. 3.
Applications of microcomputers in educational and training settings. Course stresses appraisal, utilization, and evaluation of microcomputer software and hardware. Implementation and management of computers in instructional environments. Teaching of basic computer literacy concepts to learners of all ages.

EDCI 561. COMPUTER-ASSISTED INSTRUCTION.
Class 1, Lab. 4, cr. 3.
Must be preceded by EDPS 530 or consent of instructor.
Major trends in computer-assisted instructing and computer-managed instruction are reviewed. Various learning design strategies are applied within an existing instructional language such as PLANIT or TUTOR, or between a computer-managed instruction system and a general interactive computer language such as BASIC. Consideration is also given to adjunct computer-based instructional materials, instructional gaming, and lesson conversion from one language to another. The course involves the development, coding, and tryout of instructional material interactively on a general purpose computer.

EDCI 562. EDUCATIONAL APPLICATIONS OF LOGO.
Class 3, cr. 3.
Prerequisite: EDCI 460, EDCI 560 or consent of instructor and knowledge of LOGO.
LOGO course examines structure and capabilities of language. Emphasis given to examining appropriate sequence and activities for use in teaching LOGO in the public schools. Students will design and implement teaching materials in the language LOGO for use on microcomputers.

EDCI 563. EDUCATIONAL APPLICATIONS OF PASCAL.
Class 3, cr. 3.
Prerequisite: EDCI 561, EDCI 562, or consent of instructor and knowledge of Pascal.
This course examines the structure and capabilities of the language Pascal. Emphasis is given to examining the appropriate sequence and activities for use in teaching Pascal in the public schools. Students will design and implement teaching materials in the language Pascal for microcomputers.

EDCI 570. AUDIO-VISUAL MEDIA FOR EDUCATION.
Cr. 1-3.
Evaluation, selection, and utilization of audio-visual media and techniques used in the instructional program of the modern school with added emphasis on the design and

* Undergraduate students may not enroll in any of these undergraduate courses until they have been admitted to teacher education and have a copy of acceptance on file in the Teacher Education Services Office.

development of multi-media presentation.

EDCI 571. PREPARATION OF INSTRUCTIONAL MATERIALS.
Class 1, Lab. 4, cr. 3.
Design and preparation of a variety of instructional materials for use by instructional materials specialists, teachers, librarians, and A-V coordinators in educational situations. Laboratory practice is provided in production of these materials.

EDCI 572. INTRODUCTION TO INSTRUCTIONAL DEVELOPMENT AND COMMUNICATION.
Class 3, cr. 3.
An introduction to the principles of designing instructional materials and to instructional communication theory and techniques. Topics include objectives, student characteristics, media selection, communication variables, message design, and systematic evaluation.

EDCI 573. MEDIA/INSTRUCTIONAL DEVELOPMENT PRACTICUM.
Cr. 2-3.
Admission by consent of the instructor.
Supervised field experiences in school media centers and/or in programs involving instructional development activities.

EDCI 574. YOUNG ADULT MEDIA AND READING.
Class 3, cr. 3.
Must be preceded by junior standing and three hours of educational psychology.
Evaluation, selection, and utilization of print and nonprint materials in the various subject fields with implications for research, recent trends and current developments in the teaching of reading.

EDCI 578. REFERENCE RESOURCES.
Class 3, cr. 3.
A study of reference services in school media centers including the most commonly used reference sources in library and audio-visual materials. Bibliographical form is emphasized.

EDCI 579. AUDIO-VISUAL SERVICES IN SCHOOL MEDIA PROGRAMS.
Class 3, cr. 3.
Must be preceded by five hours of education and psychology.
Current trends, functions, and processes of media services in educational situations with emphasis on nonprint media and equipment.

EDCI 580. FOUNDATIONS OF CURRICULUM DEVELOPMENT.
Class 3, cr. 3.
Introduction to major sources of curriculum ideas and objectives; significant forces influencing curriculum decision making; different conceptions of curriculum and types of curriculum designs; generic principles of curriculum construction and processes of curriculum implementation.

EDCI 581. CURRICULUM FOR EMERGING ADOLESCENTS.
Class 3, cr. 3.
Middle-school curriculum concepts, characteristics of emerging adolescent youth, and implications for designing and implementing curricula concurrent with these characteristics and needs.

EDCI 582. CATALOGING AND CLASSIFICATIONS.
Class 3, Lab. 2, cr. 3.
Must be preceded by junior standing.
Principles of cataloging and classification of educational media and organization of these resources, with laboratory practice in cataloging books and audio-visual materials and in ordering and using printed cards.

EDCI 583. ADMINISTRATION OF SCHOOL MEDIA PROGRAMS.
Class 3, cr. 3.
Must be preceded by EDCI 570, 571, 578, or consent of instructor.
Principles of administration and management of school media programs with emphasis on organization, program development, staff, budget, and space.

EDCI 584. SECONDARY SCHOOL CURRICULUM.
Class 3, cr. 3.
Objectives, organization, and administration of the secondary school curriculum.

EDCI 585. MULTICULTURAL EDUCATION.
Class 3, cr. 3.
Concepts and theories of ethnicity and cultural pluralism: Implications for educational change. Examination of value systems and cultural characteristics of various ethnic groups, different ethnic learning styles, ethnically pluralistic curriculum content and instructional materials, and conceptual curriculum design strategies for implementing multicultural education.

EDCI 589. SPECIAL TOPICS FOR TEACHERS.
Class 1-4, cr. 1-4.
(May be repeated for credit.)
Offered only on Pass/No Pass Option.
Consideration of concerns of experienced educational personnel related to educational development, technology, methodology and curriculum. Designed for workshop or inservice formats, Not available for use in graduate degree programs.

EDCI 590. INDIVIDUAL RESEARCH PROBLEMS.
Cr. 1-6.
Must be preceded by six hours of psychology and six hours of education or equivalent professional training.
Opportunities for students to study particular problems under the guidance of a member of the staff. This plan of individualized instruction may be used in any field of education or vocational education. Does not include thesis work.

EDCI 591. SPECIAL TOPICS IN EDUCATION.
Class 1-4, cr. 1-4.
(May be repeated for credit.)
Group study of a current problem or special topic of interest to professional educational personnel. Intensive study of research, theory, or practical aspects of a particular issue within the usual graduate class format.

EDCI 601. PROBLEMS IN LITERACY ACQUISITION: ADVANCED PRACTICUM.
Class 1, Lab. 5, cr. 3.
Prerequisite: EDCI 500 and 501 or consent of instructor. (May be repeated for credit at an advanced level.)
Examines strategies for teaching elementary or secondary students who experience moderate to severe difficulties acquiring reading, writing, and other aspects of language. Supervised practicum.

EDCI 602. LANGUAGE ARTS IN THE ELEMENTARY SCHOOL.
Class 3, cr. 3.
Must be preceded by EDCI 329, its equivalent, or admission by consent of instructor.
Research, recent trends and current developments in the field of language arts and implications for classroom practice in the elementary school.

EDCI 603. READING IN THE ELEMENTARY SCHOOL.
Class 3, cr. 3.
Must be preceded by EDCI 306, its equivalent, or admission by consent of instructor.
Research, recent trends and current developments in the field of reading instruction. Emphasis will be on improving developmental reading in the elementary school programs rather than on surveying remedial programs.

EDCI 604. SOCIAL STUDIES IN THE ELEMENTARY SCHOOL.
Class 3, cr. 3.
Must be preceded by EDCI 329, its equivalent, or admission by consent of instructor.
Social studies-content and place in the modern elementary education curriculum. Materials, instruction techniques, evaluation procedures, and understanding the syntax of the structure of social studies.

EDCI 605. SCIENCE IN THE ELEMENTARY SCHOOL.
Class 3, cr. 3.
Must be preceded by EDCI 330, its equivalent, or consent of instructor.
Analysis of historical developments and present trends in elementary school science education; the designing, implementation, and evaluation of science programs; the role of research in present and future developments.

EDCI 606. MATHEMATICS IN THE ELEMENTARY SCHOOL.
Class 3, cr. 3.
Must be preceded by EDCI 330, or consent of instructor.
Historical and current curriculum developments in mathematics education with implications for classroom practice; analysis of instructional strategies; cognitive development; use of research results.

EDCI 607. IMPLICATIONS OF RESEARCH AND THEORY FOR PROBLEMS IN ELEMENTARY SCHOOLS.
Class 3, cr. 3.
Identification and study of the major problems of elementary schools. Emphasis on developing problem-solving skills and their use in planning solutions to problems identified by individual students.

EDCI 608. INDIVIDUALIZING INSTRUCTION IN THE ELEMENTARY AND SECONDARY SCHOOL.
Class 3, cr. 3.
Must be preceded by completion of a teacher certification program or consent of instructor.
This course explores the foundations underlying individualized instruction, the preparation of the individualized instruction materials for the classroom, the role of research in individualized instruction, and the future trends and issues in individualized instruction.

EDCI 613. SEMINAR IN THE ENGLISH LANGUAGE ARTS.
(ENGL 691).

EDCI 621. MEDIA RESOURCES.
Class 3, cr. 3.
Must be preceded or accompanied by EDCI 570, 571, 578.
Theory and practice of selection and collection development for school media centers including acquisition, reviewing, and procedures for evaluating media resources. Literature and audiovisual media in the various subject fields with attention to bibliographic and fact sources including leaders, curriculum movements, and contemporary materials.

EDCI 624. SEMINAR IN SOCIAL STUDIES EDUCATION.
Class 3, Cr. 3.
(May be repeated for credit.) (C)
An investigation of various aspects of the teaching of the social studies. One topic is dealt with in each enrollment. Master's candidates are expected to complete the first three topics. Areas include: (1) philosophic concepts used in the social studies; (2) curricular analysis and examination of new social studies materials; (3) methods of inquiry in the social studies; (4) research methodology in the social studies.

EDCI 661. COMPUTER CURRICULUM DESIGN.
Class 3, cr. 3.
Prerequisite: EDCI 561, 562, 563, 580 or consent of instructor.
Course examines role of microcomputers in elementary and secondary school curriculum. Emphasis placed on developing curricula for computer literacy, computer programming, and computer applications within subject matter areas. Students develop and evaluate computer curriculum projects based on these areas.

EDCI 663. INTERACTIVE VIDEO.
Class 3, cr. 3.
Prerequisite: EDCI 561 AND EDCI 572 or consent of instructor.
Examines interactive video: computers interfaced with videodisc and videotape players. Includes history, overview, research evaluation, design/production techniques, and programming for interactive video.

EDCI 664. CURRICULUM DESIGN FOR COMPUTER-BASED INSTRUCTION.
Class 3, cr. 3.
EDCI 561 and 572 or consent of instructor.
This course addresses the application of instructional design principles and computer technology to the design of computer-based instructional materials. Includes research on the use of computers for instruction and courseware design as a research tool.

EDCI 671. MATERIALS DESIGN FOR INSTRUCTIONAL SYSTEMS.
Class 1, Lab. 4, cr. 3.
Must be preceded by EDCI 570 and 571.
The design, development, and analysis of instructional materials for small-scale instructional systems. This course will involve the study and formulation of behaviorally stated objectives, content structures, systems analysis, consideration of materials preparation problems, an examination of various arrangements for control of stimulus presentations, and the consideration of various arrangements of mediational devices for evaluation.

EDCI 672. ADVANCED INSTRUCTIONAL DEVELOPMENT AND SYSTEMS TECHNOLOGY.
Class 3, cr. 3.
Must be preceded by EDCI 572 or by consent of instructor.
Applications of instructional systems technology to educational situations. In-depth treatment of learner analysis, task analysis, learning activities design, learner verification and summative evaluation. Administration of instructional systems and management of subsystems are studied.

EDCI 673. MEDIA RESEARCH.
Class 3, cr. 3.
Prerequisite: PSY 500 and EDCI 621.
Principles and scientific procedures for locating, interpreting, and applying media research including

critical review and evaluation of media research studies. Each student will review one area of special interest in media research, identify a specific problem and write a media research proposal. This course is designed to assist the school media professional in interpreting and applying current media research.

EDCI 681. ELEMENTARY SCHOOL CURRICULUM.
Class 3, cr. 3.
Must be preceded by 12 hours in education and psychology.
Needs of children and society; modern programs; procedures for developing a curriculum, including ways to improve the present offerings of a school.

EDCI 695. INTERNSHIP IN EDUCATIONS.
Cr. 3-9.
Admission by consent of instructor. (Amount of credit to be determined by nature and extent of the assignment.)
A special course in selected areas of education, designed to provide practical field experience under professional supervision in selected situations related to the candidate's area of specialization.

EDCI 698. RESEARCH.
M.S. Thesis
Cr. 1-18.

EDUCATION, FOUNDATIONS, AND ADMINISTRATION

EDFA 101. INTRODUCTION TO THE FOUNDATIONS OF EDUCATIONS.
Class 1, Lab. 2, cr. 1.
Acquaints students with the broad foundations of education and the roles of various professional educators. Characteristics of the professional educator and desired competencies and skills of the teacher are explored to assist students in making decisions regarding their own interest in and capabilities to enter the profession. Directed observation, self-study materials and seminar sessions are employed. (Classes are composed of Elementary, Secondary and All-Grade education students. Emphasis is on the total education systems.)

EDFA 221. SOCIETY, SCHOOL AND THE PROFESSIONAL EDUCATOR.
Class 3, cr. 3.
Not open to students with credit in EDFA 400.
Examination of philosophical ideas and social forces which have shaped and continue to shape public education. Consideration of past, present and future relationships between school and society. The role of the professional educator in shaping these relationships. Introduction to basic legal responsibilities and ethical guidelines which determine professional conduct. Consideration of contemporary educational issues. Selected schools representing diverse educational philosophies, cultural settings and levels will be visited and studied.

EDFA 490. INDIVIDUAL RESEARCH AND TEACHING EXPERIENCE.
Cr. 1-4.
Prerequisite: consent of department.
Opportunity for undergraduate students to investigate particular problems in the field of education under supervision.

EDFA 491. TOPICS AND ISSUES IN EDUCATION.
Class 1, cr. 1.
Provides the student with the opportunity to strengthen the preparation program though the study of selected educational topics and issues based on individual needs and interests. One topic is dealt with in each enrollment.

EDFA 500. HISTORY AND PHILOSOPHY OF EDUCATION.
Class 3, cr. 3.
(May be repeated for credit.)
Consideration of the major ideas, trends, and movements in the development of education. This course will be taught under three separate topics as follows: (1) history of western education, (2) history of American education, and (3) philosophy of American education. Students may enroll for more than one section.

EDFA 503. THE CONSTITUTION AND AMERICAN EDUCATION.
Class 3, cr. 3.
Prerequisite: 12 hours of education and psychology.
This course is designed to give the student an opportunity to analyze the basic constitutional framework within which law and education must function. Examines role of courts in determining educational policy. Student is led to make a critical examination of the constitutional basis justifying court decisions. Attention is given to the impact of court decisions on educational policy, utilizing a case study method.

EDFA 510. THE TEACHER AND THE LAW.
Class 3, cr. 3.
Basic course for teachers and prospective teachers to examine legal rights and responsibilities of school personnel and students. Areas covered: due process, teacher negligence and liability, contract rights, tenure laws, student discipline, teacher organizations and collective bargaining, and other school-related topics.

EDFA 511. INFORMATION SYSTEMS IN EDUCATION.
Class 3, cr. 3.
An overview of automated data processing applications to education. Primary emphasis on administrative applications for pupil, staff, and facility, program, and financial accounting.

EDFA 512. FOUNDATIONS OF EDUCATIONAL ADMINISTRATION.
Class 3, cr. 3.
Administration of education; roles of local, state, and federal government. Focus on purpose, organization, task areas, and processes of educational administration.

EDFA 513. EDUCATIONAL FACILITIES PLANNING.
Class 3, cr. 3.
Must be preceded by EDFA 512 or consent of instructor.
Systems approach as a basis for school facilities planning. Study directed toward procedures for solving facilities problems. Emphasis on techniques for developing and securing technical information.

EDFA 514. ECONOMICS OF EDUCATION.
Class 3, cr. 3.
Must be preceded by EDFA 512 or consent of instructor.
A general course in financing education including current economic theories, sources of revenues, and trends in fiscal structure and operations in education.

EDFA 516. SCHOOL-COMMUNITY RELATIONS.
Class 3, cr. 3.
Must be preceded by EDFA 512 or consent of instructor.

This course will stress concepts and principles relevant to school-community interaction. It will focus on the new roles of the public in education and will deal with problems encountered by educators in communicating with the public.

EDFA 518. TECHNIQUES AND CONCEPTS OF STUDENT TEACHER SUPERVISION.
Class 1-3, cr. 1-3.
Teacher certification required.
(May be repeated for credit.)
Supervising teacher's role in teacher training process. Factors related to orientation of student teacher to school setting. Development of competencies in student teacher supervisor. Review of current methodologies involving student teacher field experience. Supervisory techniques related to student teaching.

EDFA 589. SPECIAL TOPICS FOR TEACHERS.
Class 1-4, cr. 1-4.
(May be repeated for credit.)
Offered only on Pass/No Pass Option.
Consideration of concerns of experienced educational personnel related to educational development, technology, methodology and curriculum. Designed for workshop or inservice formats Not available for use in graduate degree programs.

EDFA 590. INDIVIDUAL RESEARCH PROBLEMS.
Cr. 1-6.
Must be preceded by six hours of psychology and six hours of education or equivalent professional training.
Opportunities for students to study particular problems under the guidance of a member of the staff. This plan of individualized instruction may be used in any field of education or vocational education. Does not include thesis work.

EDFA 591. SPECIAL TOPICS IN EDUCATION.
Class 1-4, cr. 1-4.
(May be repeated for credit.)
Group study of a current problem or special topic of interest to professional educational personnel. Intensive study of research, theory, or practical aspects of a particular issue within the usual graduate class format.

EDFA 604. SECONDARY SCHOOL ADMINISTRATION.
Class 3, cr. 3.
Must be preceded by EDFA 512 or consent of instructor.
Study of the role and responsibilities of the secondary school principalship; focus on organization and administration of students, staff, and educational program; special consideration devoted to schedule construction, program accounting, and school and community relations.

EDFA 605. ELEMENTARY SCHOOL ADMINISTRATION.
Class 3, cr. 3.
Must be preceded by EDFA 512 or consent of instructor.
Study of role and responsibilities of the elementary school principalship; focus upon leadership functions in staff and pupil personnel, school and class organization, plant management, instructional and educational program, and school and community relations.

EDFA 606. SEMINAR: THE SCHOOL PRINCIPALSHIP.
Cr. 2-4.
Must be preceded by EDFA 604 or 605.
Individual exploration in depth of selected aspect of the school principalship and critical analysis of related issues.

EDFA 607. ADMINISTRATION OF EDUCATIONAL SYSTEMS.
Class 3, cr. 3.
Prerequisite: EDFA 512 or consent of instructor.
An examination of administrative function, process, structure, and practice. Special emphasis given to theory development in administration. Exploration of system analysis applications to educational administration.

EDFA 608. BUSINESS MANAGEMENT IN EDUCATION.
Class 3, cr. 3.
Prerequisite: EDFA 514 or consent of instructor.
Examination of internal and external determinants of school fiscal policy. Experiences with fiscal procedures for school budgeting and accounting, including preparation of a school budget.

EDFA 609. LEGAL ASPECTS OF AMERICAN EDUCATION.
Class 3, cr. 3.
Must be preceded by nine hours of education or consent of instructor.
Legal foundations of education as established by constitutional provisions, court decisions, opinions of attorney generals, administrative rulings and executive directives. Emphasis on legal theory and principles currently in state of change. Stress on case study method of investigation into educational law.

EDFA 610. SUPERVISION OF INSTRUCTION AND INSTRUCTIONAL PERSONNEL.
Class 3, cr. 3.
Must be preceded by EDFA 512 or consent of instructor.
Examination of the functions of school administration which focuses on achievement of instructional expectations of educational service. Emphasis on developing an individualized supervisory program for instructional personnel.

EDFA 611. PERSONNEL ADMINISTRATION.
Class 3, cr. 3.
Must be preceded by EDFA 512 or consent of instructor.
Provision of a conceptual framework for dealing with school personnel problems. Emphasis placed on implications of social change for personnel administration, the nature and scope of the personnel function, problems created by conflict between individual needs and organizational demands, and the strategies and consequences of collective negotiations.

EDFA 613. CLINIC FOR EDUCATIONAL LEADERS.
Class 3, cr. 3.

EDFA 695. INTERNSHIP IN EDUCATION.
Cr. 3-9.
Admission by consent of instructor.
(Amount of credit to be determined by nature and extent of the assignment.)
A special course in selected areas of education, designed to provide practical field experience under professional supervision in selected situations related to the candidate's area of specialization.

EDFA 698. RESEARCH.
Cr. 1-18.
M.S. Thesis.

EDUCATION AND PROFESSIONAL STUDIES

EDPS 220. PSYCHOLOGY OF LEARNING.
Class 2, Lab. 3, cr. 3.
Not open to students with credit in EDPS 230.
An examination of the learner and learning. Study of the cognitive, social, physical, moral and personality development from early childhood through adolescence; implications of developmental stages for educational planning and intervention. Principles of basic learning theories, facilitative conditions and strategies for enhancing learning; classroom management as a means to foster the learner's development and learning. Survey of techniques for assessing the learner, learning and identification of learning dysfunctions. Supervised laboratory and field experiences in area schools for observation, involvement and practice with learners and learning.

EDPS 260. INTRODUCTION TO SPECIAL EDUCATION.
Class 3, cr. 3.
A survey of the field of special education; consideration of the kinds of students served, why they need special help, and how it can be provided.

EDPS 334. ASSESSMENT OF LEARNING-DISABLED CHILDREN.
Class 3, Lab. 2, cr. 4.
Must be preceded by EDPS 564.
This course prepares the preservice teacher to assess the student with learning disabilities using a variety of formal and informal instruments and procedures. The concepts of validity and reliability are stressed, and the course concludes with the writing of an educational profile to satisfy the requirements of P.L. 94-142.

EDPS 486. GUIDANCE IN THE CLASSROOM: ELEMENTARY AND MIDDLE SCHOOL.
Class 3, cr. 3.
Designed to acquaint students with guidance activities appropriate for use by the classroom teacher, this course focuses on areas such as study of pupil behavior, individual appraisal, career development, consultation, and group processes. Opportunity for students to pursue activities at multilevels is provided.

EDPS 490. INDIVIDUAL RESEARCH AND TEACHING EXPERIENCE.
Cr. 1-4.
Prerequisite: Consent of department.
Opportunity for undergraduate students to investigate particular problems in the field of education under supervision.

EDPS 491. TOPICS AND ISSUES IN EDUCATION.
Class 1, cr. 1.
Provides the student with the opportunity to strengthen the preparation program though the study of selected educational topics and issues based on individual needs and interests. One topic is dealt with in each enrollment.

EDPS 500. HUMAN RELATIONS IN GROUP COUNSELING.
Class 2, Lab. 2, cr. 3.
Admission by consent of instructor.
Human relations skills; the functioning and use of group processes. Leadership styles are treated by the instructional component. Students participate in laboratories designed to increase personal awareness and relationship skills.

EDPS 501. INTRODUCTION TO GUIDANCE.
Class 3, cr. 3.
Must be preceded by 12 hours of psychology and education or equivalent professional training.
Treats the history, principles, services, and theoretical development of guidance with consideration given to counselor role and functions, current practices, and emerging trends and issues.

EDPS 502. CHILD GUIDANCE AND COUNSELING.
Class 3, cr. 3.
Must be preceded by 12 hours of psychology and education or equivalent professional training.
Guidance and counseling problems arising with children and principles and techniques applicable to their solution. role of the counselor, classroom teacher, and other supporting personnel in providing services to children and parents.

EDPS 505. CAREER THEORY AND INFORMATION.
Class 3, cr. 3.
Treats career development theories which emphasize aspects of the self in decision-making, occupational classification systems, and education and vocational information with applications to individual and group counseling.

EDPS 506. PREPRACTICUM IN CAREER COUNSELING.
Class 2, Lab. 2, cr. 3.
Must be preceded by or taken concurrently with EDPS 505 and PSY 505 or equivalents.
Practical experience in selecting and using appraisal instruments, occupational classification systems, occupational information systems, simulation and mechanized information systems, in career counseling. Designed to prepare the student for Counseling Practicum.

EDPS 530. ADVANCED EDUCATIONAL PSYCHOLOGY.
Class 3, cr. 3.
Must be preceded by PSY 120 and EDPS 220.
Theories of learning and development, research on instruction and learning, and principles of measurement applied to educational problems.

EDPS 531. INTRODUCTION TO MEASUREMENT AND EVALUATION.
Class 3, cr. 3.
An introduction to the basic concepts and principles of measurement and evaluation with special emphasis on descriptive statistics, and teacher made and standardized tests.

EDPS 532. MEASURING EDUCATIONAL ACHIEVEMENT.
Class 3, cr. 3.
A course in developing, analyzing, and interpreting measures of educational achievement. Emphasis is placed upon cognitive tests. Non-test techniques for assessing behavior are also explored. Prior experience with statistics or measurement, although helpful, is not required for this course.

EDPS 533. INTRODUCTION TO EDUCATIONAL RESEARCH I: METHODOLOGY.
Class 3, cr. 3.
Must be preceded by PSY 120 or consent of instructor.
An introductory course in educational research and evaluation methodology which considers the various methods of educational research, the formulation of research hypotheses, and the preparation of research reports.

EDPS 535. PERSONAL-SOCIAL DYNAMICS IN THE CLASSROOM.
Class 3, cr. 3.
Prerequisite: EDPS 220 or equivalent.
Stresses understanding of personal and socio-emotional growth of students and teachers in the school environment. Attention is given to means of promoting personal and socio-emotional growth.

EDPS 540. GIFTED, CREATIVE, AND TALENTED CHILDREN.
Class 3, cr. 3.
Prerequisite: EDPS 220 or equivalent.
Introduction to intellectual, social, and emotional characteristics of students who are gifted. Philosophy of gifted education. Multi-talent concept of giftedness: intellectual, academic, creative, artistic, and leadership. Criteria for selecting instructional materials and methods. Designing learning experiences for students who are gifted.

EDPS 541. IDENTIFICATION AND EVALUATION IN GIFTED EDUCATION.
Class 3, cr. 3.
Prerequisite: EDPS 531 or equivalent or consent of instructor.
Introduction to instruments and procedures for identifying students who are gifted, creative and talented. Procedures for evaluation of gifted programs and individual student progress. Also covers selection strategies and guidance of the students who are gifted.

EDPS 542. CURRICULUM AND PROGRAM DEVELOPMENT IN GIFTED EDUCATION.
Class 3, cr. 3.
Prerequisite: EDPS 540 or equivalent.
Introduction to curricular materials, curriculum development, and programs for students who are gifted, creative, and talented. Serves needs of teachers and administrators who are developing programs and methods of orientation and inservice training of teachers.

EDPS 563. EDUCATIONAL ASSESSMENT OF EXCEPTIONAL CHILDREN.
Class 2, cr. 2, or Class 2, Lab. 2, cr. 3.
Prerequisite: a course in tests and measurement or consent of instructor.
An introduction to the procedures for educational assessment of children who are exceptional. Emphasis is given to criterion-referenced, norm-referenced, and observational assessment instruments and procedures. Practicum to operationalize skills and knowledge.

EDPS 564. FOUNDATIONS IN THE EDUCATION OF EXCEPTIONAL CHILDREN.
Class 3, cr. 3.
Prerequisite: Completion of a teacher certification program or consent of instructor.
(May be repeated for credit.)
Etiologies and characteristics of students with varying exceptionabilities including (A) Developmental Learning, (D) Learning Disabilities, (E) Emotional Disturbance. Laboratory experience with children with disabilities is required in task oriented instruction. One topic is dealt with in each enrollment.

EDPS 565. STRATEGIES IN TEACHING EXCEPTIONAL CHILDREN WITH VARYIING DISABILITIES.
Class 2-3, cr. 2-3.
Prerequisite: Completion of a teacher certificate progrom or consent of instructor. (May be repeated for credit.)
Includes: (1) multiply handicapped; (2) educable mentally retarded; (3) trainable mentally retarded; (4) learning disabled; (5) emotionally disturbed; (6) early childhood; (7) exceptional adolescents; (8) task-oriented instruction. One topic is dealt with in each enrollment.

EDPS 566. SUPERVISED TEACHING OF EXCEPTIONAL CHILDREN WITH VARYING DISABILITIES.
Cr. 4.
Supervised teaching of students with (D) Learning Disabilities, (E) Emotional Disturbance. Laboratory experience is required. One topic is dealt with in each enrollment.

EDPS 567. TEACHING OF EXCEPTIONAL CHILDREN.
Class 3, cr. 3.
Prerequisite: admission to special education certification program or consent of instructor.
Techniques of managing behavior of students who are exceptional emphasizing the development of interpersonal communication skills such as life space interviewing. Special attention to curriculum modification to facilitate humanistic teaching of children who are emotionally disturbed.

EDPS 568. ISSUES AND TRENDS IN SPECIAL EDUCATION.
Class 3, cr. 3.
Must be preceded by EDPS 566 or consent of instructor.
Consideration of various conceptual models of exceptionality and implications for individuals with special needs. Emphasis is devoted to the labeling controversy, categorical vs. non-catagorical special education, litigation and the rights of children, alternative educational delivery systems, applications of technology and "normalization."

EDPS 589. SPECIAL TOPICS FOR TEACHERS.
Class 1-4, cr. 1-4.
(May be repeated for credit.)
Offered only on Pass/No Pass Option.
Consideration of concerns of experienced educational personnel related to educational development, technology, methodology and curriculum. Designed for workshop or inservice formats. Not available for use in graduate degree programs.

EDPS 590. INDIVIDUAL RESEARCH PROBLEMS.
Cr. 1-6.
Must be preceded by six hours of psychology and six hours of education or equivalent professional training.
Opportunities for students to study particular problems under the guidance of a member of the staff. This plan of individualized instruction may be used in any field of education or vocational education. Does not include thesis work.

EDPS 591. SPECIAL TOPICS IN EDUCATION.
Class 1-4, cr. 1-4.
(May be repeated for credit.)
Group study of a current problem or special topic of interest to professional educational personnel. Intensive study of research, theory, or practical aspects of a particular issue within the usual graduate class format.

EDPS 600. COUNSELING THEORIES AND TECHNIQUES.
Class 3, cr. 3.
Must be preceded by satisfactory completion of six graduate hours of counselor education courses and admission by consent of instructor.
Examination of major counseling theories and counseling techniques, professional and ethical issues.

EDPS 601. COUNSELING THEORIES AND TECHNIQUES LABORATORY.
Lab. 4, cr. 2.
Corequisite: EDPS 600 or consent of instructor.
Use of counseling techniques in a supervised laboratory; application of theories and techniques within varying employment settings.

EDPS 602. GROUP COUNSELING THEORIES AND TECHNIQUES.
Class 3, cr. 3.
Prerequisite: EDPS 500.
An examination of current concepts, theories, and techniques of group counseling in mental health and educational settings. Emphasis placed on human relations training, basic encounter, person centered, psychodrama, cognitive-behavioral, Adlerian and gestalt approaches, research, and ethical considerations in lecture and skill-building exercise formats.

EDPS 603. CASE STUDY AND INDIVIDUAL ANALYSIS IN COUNSELING AND GUIDANCE.
Class 2, Lab. 2, cr. 3.
Must be preceded by EDPS 600, PSY 505, and consent of instructor.
Method and technique of comprehensive study of individuals with emphasis on the function of case study in the counselor's understanding of development, diagnosis, and treatment of special problems.

EDPS 609. PROGRAM DEVELOPMENT AND ORGANIZATION IN HUMAN SERVICES.
Class 2-3, cr. 2-3.
Prerequisite: EDPS 501 or 502 or 503 or 504.
Issues and procedures in program development, management, organization, and administration for school guidance, college student affairs, and mental health services. Also treats administrative theory, intervention strategies, staff development and evaluation.

EDPS 610. COUNSELING PRACTICUM.
Class 1, Lab. 6, cr. 2 or 3.
Prerequisite: EDPS 600 and consent of instructor.
(May be repeated for credit.)
(A) child/elementary school (B) adolescent/secondary (C) adult/college (D) group. Supervised counseling with either children, adolescents, or adults.

EDPS 614. ADVANCED COUNSELING PRACTICUM.
Class 1, Lab. 6, cr. 1-3.
Prerequisite: EDPS 610.
Admission by consent of instructor.
(May be repeated for credit.)
Supervised use of personal and career counseling techniques applied to complex and difficult client situations.

EDPS 616. SUPERVISED FIELD PRACTICE.
Cr. 1-6.
Prerequisite: 6 hours of counselor education or consent of instructor.
(May be repeated for credit.)
(A) school counseling; (B) college student personnel; (C) agency counseling; (D) counselor education; (E) college counseling. Supervised field practice in schools, colleges or agencies in which there are counseling or student personnel services.

EDPS 620. COUNSELING SEMINAR.
Class 3, cr. 1-4.
(May be repeated for credit.)
Open to graduate students who have successfully completed 12 semester hours of previous counseling and personnel services courses.
Recent investigation and research in (1) counselor supervision, (2) professional issues, (3) counseling theories, (4) education of counselors and student personnel workers, (5) counseling methodology, (6) vocational development, (7) elementary school counseling, (8) counselor consultation, and (9) other relevant topics. One topic is dealt with in each enrollment.

EDPS 663. ORGANIZATION AND ADMINISTRATION OF SPECIAL EDUCATION.
Class 3, cr. 3.
Must be preceded by six hours of educational administration and/or supervision, or by consent of instructor.
This is seminar course in organization and administration designed to prepare personnel for administrative roles in special education. Areas of major concerns to special education administrators will be explored and various approaches to handling problems examined.

EDPS 664. SEMINAR IN SPECIAL EDUCATION.
Class 1-4, cr. 1-4.
Admission by consent of instructor.
(May be repeated for credit.)
A critical analysis of research, practice, and selected problems in special education for advanced graduate students, including (1) special assignments; (2) trainable mentally retarded; (3) learning disabled; (4) emotional disturbance; (5) nonspeech communication; (6) law; (7) special education research. One topic is dealt with in each enrollment.

EDPS 695. INTERNSHIP IN EDUCATION.
Cr. 3-9.
Admission by consent of instructor.
(Amount of credit to be determined by nature and extent of the assignment.)
A special course in selected areas of education, designed to provide practical field experience under professional supervision in selected situations related to the candidate's area of specialization.

EDPS 698. RESEARCH.
M.S. Thesis.
Cr. 1-18.

ELECTRICAL ENGINEERING

EE 201. LINEAR CIRCUIT ANALYSIS I.
Class 3, cr. 3.
Corequisites: MA 261, PHYS 261, EE 207.
Prerequisites: MA 163, MA 164, and PHYS 152 with a minimum grade of C.
Volt-Ampere characteristics of circuit elements; independent and dependent sources; Kirchoff's Laws and circuit equations. Source transformations; Thevenin's and Norton's Theorems; Superposition. Transient response of RC, RL, and RLC circuits. Sinusoidal steady-state and impedance. Instantaneous and average power.

EE 202. LINEAR CIRCUIT ANALYSIS II.
Class 3, cr. 3.
Prerequisites: EE 201. Corequisites: MA 262, EE 218.
A continuation of EE 201. The complex frequency plane; resonance; coupled circuits. Two-port network parameters. Polyphase analysis. Fourier series; Fourier Transform; Laplace Transform.

EE 207. ELECTRONIC MEASUREMENT TECHNIQUES.
Lab. 3, cr. 1.
Corequisite: EE 201.
Introduction to basic instrumentation and measurement techniques; introduction to the experimental methods necessary for laboratory

investigation. Introduction to laboratory report writing methods. The student is introduced to computer-aided circuit analysis methods.

EE 218. LINEAR CIRCUITS LABORATORY II.
Lab. 3, cr. 1.
Corequisite: EE 202.
A continuation of EE 207, with the introduction of advanced measurement methods and more sophisticated instrumentation.

EE 275. ELECTRONICS-DEVICES.
Class 2, Lab. 3, cr. 3.
Prerequisites: EE 202, EE 218.
Transport phenomena in semiconductors; junction diode theory; diode circuits. Bipolar Junction Transistor and Field Effect Transistor theory and characteristics, transistor biasing and stabilization techniques. Low and high frequency analysis of transistors. Multistage amplifier analysis and design.

EE 291. INDUSTRIAL PRACTICE I.
Cr. 0.
For co-operative engineering students only.
Prerequisite: Must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

EE 292. INDUSTRIAL PRACTICE II.
Cr. 0.
For co-operative engineering students. only.
Prerequisite: must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

EE 302. PROBABILISTIC METHODS IN ELECTRICAL ENGINEERING.
Class 3, cr. 3.
Prerequisite: MA 262; corequisite: ENGR 325.
An introductory treatment of probability theory including distribution and density functions, moments and random variables. Applications of normal and exponential distributions. Estimation of means, variances, correlation, and spectral density functions. Random processes and responses of linear systems to random inputs.

EE 311. ELECTRIC AND MAGNETIC FIELDS.
Class 3, cr. 3.
Prerequisites: MA 262, PHYS 261.
Continued study of vector calculus, electrostatics, and magnetostatics. Maxwell's equations. Introduction to electromagnetic waves, transmission lines, and radiation from antennas.

EE 321. PRINCIPLES OF ELECTROMECHANICAL ENERGY CONVERSION.
Class 3, cr. 3
Prerequisites: EE 202, EE 311.
The general theory of electromechanical energy conversion is set forth wherein electric circuit variables are related to electromagnetic and electrostatic forces. The fundamental concepts of rotating electric machines are presented including the basic equations and operational behavior of alternating and direct current machines. Attention is also given to special purpose motors for control and robotics applications.

EE 322. ELECTROMECHANICAL ENERGY CONVERSION LABORATORY.
Lab. 3, cr. 1.
Corequisite: EE 321.
Laboratory exercises in the basic electromechanical energy conversion processes and fundamental devices. DC motor and generator characteristics. Synchronous motor and generator characteristics, induction motors.

EE 330. INTRODUCTION TO MICROPROCESSORS.
Class 2, Lab. 3, cr 3.
Prerequisite: EE 370.
Introduction to microprocessors and microprocessor based systems. Introduction to computer architecture and hardware devices. Machine language and assembly language programing techniques; integer, fixed point, and floating point representations; control of digital hardware and peripheral devices by software; input/output using both hardware and software; typical applications of microprocessors.

EE 332. MODERN FILTER DESIGN.
Class 3, cr. 3.
Prerequisite: EE 202.
Network stability, solution to the filtering approximation problem via Butterworth, Chebychev, elliptical, etc., approaches. Transfer function scaling and type transformations. Passive filter implementation using Foster and Cauer techniques. Active filter implementation using operational amplifiers in various configurations.

EE 335. ELECTRONICS-SYSTEMS.
Class 2, Lab. 3, cr. 3.
Prerequisite: EE 275.
Topics in multistage amplifiers, feedback amplifiers, oscillators, operational amplifiers, analog systems, power amplifiers and systems, communication systems.

EE 363. SOFTWARE ENGINEERING; C LANGUAGE.
Class 1, cr. 1.
Prerequisite: ENGR 160 or consent of instructor.
C is a general purpose high-level language with features to facilitate such tasks as systems programming and the structuring of data. C is used in electrical engineering design courses and research work. Students becoming proficient in C language programming will learn techniques of structured programming.

EE 370. DIGITAL SYSTEMS-LOGIC DESIGN.
Class 2, Lab. 3, Cr. 3.
Prerequisites: EE 218, ENGR 233.
Introduction to the logical design and analysis of digital systems; Boolean algebra; combinational logic; minimization techniques; Karnaugh mapping. Introduction to sequential systems analysis and design.

EE 371. MICROPROCESSOR SYSTEMS.
Class 2, Lab. 3, cr 3.
Prerequisite: EE 330.
Microprocessor based system design; system bus organization; CPU design. Interfacing RAM and ROM memories to microprocessors; input-output techniques; peripheral interfacing and interface standards. Application of CAD software to the design of microcomputer systems.

EE 375. DIGITAL SYSTEMS-ELECTRONICS.
Class 2, Lab. 3, cr. 3.
Prerequisites: EE 275.
Analysis and design of digital electronic circuits. Transistor-transistor logic (TTL), emitter coupled logic (ECL), and FET logic circuits; memory circuits. The bistable, monostable, and astable multivibrators. Introduction to A/D and D/A converters.

EE 393. INDUSTRIAL PRACTICE III.
Cr. 0.
For co-operative engineering students only.

Prerequisite: must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

EE 394. INDUSTRIAL PRACTICE IV.
Cr. 0.
For co-operative engineering students only.
Prerequisite: must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

EE 395. INDUSTRIAL PRACTICE V.
Cr. 0.
For co-operative engineering students only.
Prerequisite: must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

EE 409. PROFESSIONAL ENGINEERING.
Class 3, cr. 3.
Prerequisite: senior classification.
Value and use of money; depreciation, economic selection, cost determination; business law, engineering procedures, and professional ethics.

EE 430. COMPUTER MEMORIES AND I/O.
Class 2, Lab. 2, cr. 3.
Prerequisite: EE 370.
Introduction to memories, input/output devices, and optical processors. Design considerations, hardware and software aspects of system design and interfacing.

EE 432. ELEMENTS OF POWER SYSTEM ENGINEERING.
Class 3, cr. 3.
Prerequisite: EE 321.
Fundamental concepts of power systems analysis, transmission line parameters, basic system models, steady-state performance, network calculations, power flow solutions, fault studies, symmetrical components, operating strategies and control.

EE 448. INTRODUCTION TO COMMUNICATION THEORY.
Class 3, cr. 3.
Prerequisites: EE 302, ENGR 325, EE 335 or EE 375.
Signal analysis, introduction to digital communication and pulse code modulation. Introduction to amplitude modulation and frequency modulation. Introduction to information theory.

EE 466. INTRODUCTION TO THE DESIGN OF DIGITAL COMPUTERS.
Class 3, cr. 3.
Prerequisites: EE 370, EE 375.
Design of computer systems by means of register transfer method. Central processor organization and design; microprogramming and control unit design; arithmetic algorithms; input-output and memory organization. Introduction to parallel processing systems.

EE 467. MICROPROCESSOR LABORATORY.
Lab. 3, cr. 1.
Prerequisite: EE 371.
Corequisite: EE 466.
Microprocessor-based systems design and development. Students will design, construct, and debug computer system experiments in an open laboratory format. Students are expected to select two to four experiments from a list provided at the beginning of the course.

EE 468. DESIGN OF COMPUTER SYSTEMS PROGRAMS.
Class 3, cr. 3.
Prerequisites: EE 363, EE 371.
The design of systems programs, in particular, operating systems and compilers. The role of systems programs as the link between computer hardware and application software is emphasized. Topics include: operating system management, resource scheduling including CPU scheduling, memory management, and file systems; problems of assembling and loading computer codes, implementation of high level language features and special purpose language compilers. Projects applying fundamental concepts to the design and construction of working systems programs.

EE 495. SELECTED TOPICS IN ELECTRICAL ENGINEERING.
Cr. 1-4.

EE 496. ELECTRICAL ENGINEERING PROJECTS.
Hours and credits to be arranged.

EE 519. CONTROL THEORY II.
Class 3, cr. 3.
Prerequisite: ENGR 483.
Acceptable for credit in the Interdisciplinary Graduate Program in Engineering. Not offered on the West Lafayette Campus.
The approximation of common nonlinearities by describing functions and the analysis of resultant system behavior. Review of matrix analysis. State-space formulation, representation, solution and design. Introduction to optimization and computational methods.

EE 532. COMPUTATIONAL METHODS FOR POWER SYSTEM ANALYSIS.
Class 3, cr. 3.
Prerequisite: EE 432.
System modeling and matrix analysis of three-phase power networks. Applications of numerical methods and computers to the solution of a variety of problems related to the planning, design, and operation of electric power systems.

EE 554. ELECTRONIC INSTRUMENTATION AND CONTROL CIRCUITS.
Class 3, cr. 3.
Prerequisites: EE 255 and 301, or equivalent.
Analysis and design of special amplifiers, pulse circuits, operational circuits, d-c amplifiers, and transducers used in instrumentation, control, and computation.

EE 595. SELECTED TOPICS IN ELECTRICAL ENGINEERING.
Cr. 1-3.
Admission by consent of instructor.
Formal classroom or individualized instruction on topics of current interest.

EE 600. RANDOM VARIABLES AND SIGNALS.
Class 3, cr. 3.
Prerequisite: EE 440 or 483 or graduate standing.
Engineering applications of probability theory. Problems on events, independence, random variables, distribution and density functions, expectations and characteristic functions. Dependence, correlation, and regression; multivariate Gaussian distribution. Stochastic processes, stationary, ergodicity, correlation functions, spectral densities, random inputs to linear systems; Gaussian processes.

EE 602. LUMPED SYSTEM THEORY.
Class 3, cr. 3.
Prerequisite: EE 301; prerequisite or corequisite: MA 511 or consent of instructor.
Basic methods of modern system theory. Time domain techniques for both linear and nonlinear systems. Characterization of both continuous and discrete-time linear systems in the time and frequency domains. Stability, controllability, and observability for linear and nonlinear systems.

EE 604. ELECTROMAGNETIC FIELD THEORY.
Class 3, cr. 3.
Prerequisite: EE 311 or graduate standing.
Review of general concepts, (Maxwell's equations, materials interaction, boundary conditions, energy flow), statics (LaPlace's equation, Poisson's equation, mapping): distributed parameter systems (classification of solutions, transmission lines and waveguide), radiation and antennas (arrays, reciprocity, Huygen's principle); a selected special topic (e.g. quantum electronics, plasmas, coupled modes, relativity).

EE 606. SOLID-STATE DEVICES.
Class 3, cr. 3.
Prerequisite: consent of instructor or graduate standing.
A relatively broad, moderate-depth coverage of semiconductor devices and related topics. The first portion of the course presents and examines semiconductor fundamental required in the operational analysis of solid state devices. This is followed by a detailed examination of the PN junction diode. Many other junction devices, such as the PIN diode, the bipolar transistor, PNPN devices, and the JFET are then analyzed as a logical extension of the basic junction diode. The final portion of the course treats heterojunction surface devices including the Schottky diode, the MOS capacitor and the MOSFET.

EE 608. COMPUTATIONAL MODELS AND METHODS.
Class 3, cr. 3.
Prerequisite: EE 362 or graduate standing.
Models of computation and techniques for the analysis of algorithm complexity; data structures; sorting and searching algorithms; graph algorithms; polynomial, matrix and FFT algorithms, theory of NP-complete problems.

EE 672. SYNTHESIS AND DESIGN OF ANALOG FILTERS.
Class 3, cr. 3.
Prerequisite: EE 301 or graduate standing.
Positive real functions. Synthesis of LC, RC, and RLC one-ports. Synthesis of LC two-ports. Synthesis of singly-terminated and doubly-terminated lossless two-ports. Design of equalizers. Design of active filters using operational amplifiers. The sensitivity problem.

EE 680. TO MODERN AUTOMATIC CONTROL THEORY.
Class 3, cr. 3.
Prerequisite: EE 602.
Theoretical methods in optimal control theory.
Topics include the calculus of variations and the Pontryagin minimum principle with applications to minimum energy problems. Geometric methods will be applied to the solution of minimum time problems. Computational methods, singular problems, observer theory, and sufficient conditions for existence of solutions are also discussed.

EE 685. DIGITAL PROCESS CONTROL AND MATHEMATICAL MODELING OF INDUSTRIAL SYSTEMS.
Class 3, cr. 3.
Prerequisite: ENGR 483 or equivalent.
This course describes the recent status of automatic control in industry with emphasis on the application of digital control. Problems involved in the use of both supervisory and direct digital control systems will be presented and the development of process mathematical models will also be covered.

EE 698. RESEARCH.
M.S. Thesis.

ELECTRICAL ENGINEERING TECHNOLOGY

EET 102. ELECTRICAL CIRCUITS I.
Class 3, Lab. 3, cr. 4.
Prerequisite or corequisite: MA 148 or MA 150.
A study of DC electrical circuits, Ohm's Law, Kirchoff's Laws, series and parallel circuits, power, introductory magnetism, ammeters, voltmeters, ohmmeters, inductance, capacitance, and an introduction to alternating voltages, currents, and reactances.

EET 105. DIGITAL FUNDAMENTALS I.
Class 2, Lab. 3, cr. 3.
A study of logic gates, binary arithmetic codes, Boolean algebra, mapping, adders, comparators, decoders, encoders, multiplexers, and demultiplexers. Small scale (SSI) and medium scale (MSI) integrated circuits are used in combinational logic circuits.

EET 110. MICROCOMPUTER USAGE IN EET.
Class 2, Lab. 0, cr. 2
Corequisite: EET 102.
An introduction to BASIC language programming. The fundamental BASIC language instructions and their application to Electronic Technology problems are discussed. The students will be introduced to DC circuit simulation software products.

EET 152. ELECTRICAL CIRCUITS II.
Class 3, Lab. 3, cr. 4.
Prerequisite: EET 102 and MA 148 or MA 150.
A study of DC and AC electrical circuits, network theorems, j operator, phasors, reactances, impedances, phase relationships, power, resonance, ideal and air-core transformers and an introduction to graphical techniques and transients.

EET 154. ANALOG ELECTRONICS I.
Class 3, Lab. 3, cr. 4.
Prerequisites: EET 102; prerequisite or corequisite: EET 152.
A study of the characteristics and applications of transistors, integrated circuits, and other solid-state devices. Includes rectifier circuits, waveform interpretation, AC and DC load lines, biasing techniques, equivalent circuits, single and multistage class A small-signal amplifiers, and h parameters.

EET 155. DIGITAL FUNDAMENTALS II.
Class 2, Lab. 3, cr. 3.
Prerequisite: EET 105.
Corequisite: EET 154.
A continuation of EET 105 with emphasis on sequential logic circuits. Flip-flops, counter analysis and design, programmable counters, shift registers, logic families, introductory computer concepts, techniques of coding, memory devices, data transmission, and conversion techniques are studied.

EET 204. ANALOG ELECTRONICS II.
Class 3, Lab. 3, cr. 4.
Prerequisites: EET 152, 154 and MA 221.
A study of the applications of transistors, integrated circuits, and other solid-state devices. Feedback principles as applied to amplifiers, oscillators, and regulated power supplies. Includes large-signal power amplifiers, and AM and FM modulation and detection techniques. Introduction to filters as ap-

plied to tuned amplifiers and rectifier circuits.

EET 212. ELECTRICAL POWER AND MACHINERY.
Class 3, Lab. 3, cr. 4.
Prerequisite: EET 152 and PHYS 218.
A study of power transformers, single and polyphase circuits. The study of DC machines, AC single and polyphase synchronous and induction machines, and an introduction to power electronics.

EET 214. ELECTRICITY FUNDAMENTALS.
Class 3, Lab. 0, cr. 3 or Class 2, Lab. 2, cr. 3.
Not open to EET majors.
This course provides an introduction to the basics of electricity and electronics. The areas of study include both theory and application of DC and AC electric motors, as well as linear and digital devices.

EET 250. COMPUTER AIDED ELECTRONIC FABRICATION.
Class 1, Lab. 6, cr. 3.
Prerequisite: Sophomore standing.
The course includes electrical drafting using hand tools; drawing electronic circuit schematic, printed circuit board (PCB) artwork design using computer-aided software tools; and complete electronic hardware product fabrication using hand tools.

EET 262. PROGRAMMABLE LOGIC CONTROL.
Class 3, Lab. 3, cr. 4.
Prerequisite: EET 155 and EET 204.
Introduction to programmable logic controllers to perform process control related functions (PID control, counting, comparison, timing, sequencing, data manipulation, digital/analog input and actuation signal control).

EET 299. ELECTRICAL ENGINEERING TECHNOLOGY.
Cr. 1-6.
Hours and subject matter to be arranged by staff. Course may be repeated for credit up to six hours.

EET 303. COMMUNICATIONS I.
Class 3, Lab. 2, cr. 4 or Class 3, Lab. 3, cr. 4.
Prerequisites: EET 204 and MA 222 or consent of instructor.
A study of AM and FM modulation and detection, receivers, transmitters, networks, filters, antennas, and transmission lines through the VHF frequency spectrum.

EET 310. BIOMEDICAL INSTRUMENTATION I.
Class 3, cr. 3.
Prerequisites: EET 204 and EET 155 or consent of instructor.
An introduction to physiological variants, the concept of measurements and problems encountered in measurements from a living human body. Detail study of transducer principles and circuit techniques in measurement in circulatory, digestive, muscular and nervous systems. System approach to intensive care monitoring and data acquisition. Evaluation of biomedical instruments to meet performance specifications and electrical safety.

EET 312. POWER ELECTRONICS.
Class 3, Lab. 3, cr. 4.
Prerequisite: EET 212 and EET 204.
Introduction to the characteristics of power semiconductor devices, diode rectifiers, thyristors, commutation techniques, controlled rectifiers, ac voltage controllers, choppers, inverters, and motor drives.

EET 317. DIGITAL CIRCUITS AND SUBSYSTEMS.
Class 3, Lab. 2, cr. 4 or Class 3, Lab. 3, cr. 4.
Prerequisite: EET 155.
An advanced study of digital circuits and their applications to various fields of electronics. System and subsystem concepts will be considered with emphasis on sequential circuits, memory, counter, timing, multiplexing, and I/O devices in application for a video monitor display.

EET 331. GENERATION AND TRANSMISSION OF ELECTRICAL POWER.
Class 3 Lab. 2, cr. 4 or Class 3, Lab. 3, cr. 4.
Prerequisite: EET 212.
A study of the generations and transmission of electrical energy. Includes techniques used by electric utilities for the protection of generating equipment and transmission lines, an introduction to the economic considerations of power plant operation, and three-winding transformers and methods of solving unbalanced three-phase systems.

EET 354. MICROPROCESSOR FUNDAMENTALS.
Class 3, Lab. 2, cr. 4 or Class 3, Lab. 3, cr. 4.
Corequisites: EET 155 or consent of instructor and CIS 260.
Use of microprocessors and related components in the design of microprocessor based systems. The architecture, programming, and interfacing of a microprocessor is studied. Consideration is given to the trade-offs between hardware and software.

EET 362. PROCESS CONTROL INSTRUMENTATION.
Class 3, Lab. 3, cr. 4.
Prerequisites: EET 262, EET 383, and MA 322.
Introduction to process control principles and practices. Study of analog and digital signal conditioning circuitry; thermal, mechanical and optical transducers; electromechanical, pneumatic and hydraulic devices; and the application of computer-aided engineering tools.

EET 368. LINEAR INTEGRATED CIRCUITS.
Class 3, Lab. 3, cr. 4.
Prerequisites: EET 204 and 383 or consent of instructor.
A study of the application of I.C. operational amplifiers, IC differential amplifiers to a multitude of applications. Specifications and limitations will also be stressed. Various special purpose I.C.'s that perform one given function will also be investigated.

EET 383. ADVANCED ELECTRICAL NETWORKS.
Class 3, cr. 3.
Prerequisites: EET 212 and MA 222.
An advanced course in network analysis that stresses network theorems, solutions of time- and frequency-domain problems.

EET 413. DIGITAL COMMUNICATIONS.
Class 3, Lab. 2, cr. 4. or Class 3, Lab. 3, cr. 4.
Prerequisites: EET 303 and EET 354.
The study and comparison of analog and digital communication techniques.

EET 415. MEDICAL ELECTRONICS.
Class 2, Lab. 2, cr. 3.
(Not open to EET majors.)
A survey covering the fundamental concepts of electricity and electronics as they relate to the medical field. Emphasis will be placed upon the safe and effective operation of electrical and biomedical electronic equipment.

EET 417. ANALOG AND DIGITAL CIRCUITS.
Class 3, Lab. 2, cr. 4. or Class 3, Lab. 3, cr. 4.
Prerequisites: EET 368 and EET 155.
Advanced study of A/D and D/A conversion, digital data acquisition and transmission, switching power supplies, phase lock techniques and an introduction to digital filters.

EET 423. CURRENT TRENDS IN TELECOMMUNICATION TECHNOLOGY.
Class 3, Lab. 3, cr. 4.
Prerequisite: EET 413 and EET 473.
This course is designed to update the student on the latest advances in communication. This course will be continuously updated to keep the student abreast of new developments in the telecommunication field.

EET 445. NEW TECHNOLOGY IN COMPUTER SYSTEMS.
Class 3, Lab. 2, cr. 4 or Class 3, Lab. 3, cr. 4.
Prerequisite: Consent of instructor.
The impact of new technologies on computer hardware and software is studied.

EET 455. MICROPROCESSORS II.
Class 3, Lab. 2, cr. 4 or Class 3, Lab. 3, cr. 4.
Prerequisites: EET 354.
An extension of EET 354. A study of data structures and algorithms commonly employed in microcomputer based designs and the use of various program development tools and aids.

EET 456. MICROCOMPUTER HARDWARE DESIGN.
Class 3, Lab. 2, cr. 4 or Class 3, Lab. 3, cr. 4.
Prerequisites: EET 354.
An extension of EET 354. Course topics include an in-depth investigation of microcomputer systems hardware including laboratory experience with available processors and peripheral devices.

EET 462. APPLICATION OF COMPUTERS IN PROCESS CONTROL.
Class 3, Lab. 3, cr. 4.
Prerequisites: EET 354, EET 383, and MA 322.
Application of computers to control industrial processes. Study of continuous- and discrete-time control systems; digital control algorithms; digital signal processing; and system control concepts applied to process control.

EET 463. COMMUNICATIONS II.
Class 3, Lab. 2, cr. 4 or Class 3, Lab. 3, cr. 4.
Prerequisites: EET 303.
A study of high frequency systems (1-meter or less) and microwave technology to familiarize the student with the fields of radar, facsimile, television, transmission lines, antennas, propagation, wave guides and cavities, and measuring equipment.

EET 473. MICROWAVES.
Class 3, Lab. 2, cr. 4 or Class 3, Lab. 3, cr. 4.
Prerequisites: EET 303 and EET 383.
A study of transmission lines and antennas, S parameters, microstrip lines, microwaves amplifiers and microwave measurements.

EET 475. COMMUNICATIONS III, ANTENNAS AND PROPAGATION.
Class 3, Lab. 3, cr. 4.
Prerequisites: EET 303, EET 463.
A study of electromagnetic waves, reflection, refraction, transmission lines, impedance matching, antenna patterns, antenna gain, directivity, bandwidth, beam-width, radiation resistance, polarization, short dipoles, the half wave dipole, long wire antennas, loop antennas, helical antennas, horn radiators, slot radiators, arrays, reflectors and lenses, and log periodic antennas.

EET 482. LINEAR CONTROL SYSTEMS.
Class 3, Lab. 2, cr. 4 or Class 3, Lab. 3, cr 4.
Prerequisite: EET 383.
A study of linear control systems using stability criteria, Bode diagrams, Nichols charts and root-locus plots.

EET 490. SENIOR DESIGN PROJECT PHASE I.
Cr. 1, hours arranged.
Prerequisite: EET 383 as well as 12 cr. hrs. of EET electives.
An extensive individual design and/or analytical project performed in consultation with one or more faculty advisors. Collaboration with representatives of industry, government agency, or community institutions is encouraged. Evidence of extensive and thorough laboratory performance is required.
PHASE I includes, but is not limited to: faculty acceptance of project proposal, defining and limiting project objectives, initial research and source contacts, procurement of materials, and periodic progress reports.

EET 491. SENIOR DESIGN PROJECT, PHASE II.
Cr. 2-5, hours arranged.
Prerequisite: EET 490.
PHASE II includes, but is not limited to: Continued research and finalized design, oral presentation to faculty and other interested parties, and a written technical report.

EET 492. DIGITAL SYSTEMS.
Class 3, Lab. 2, cr. 4. or Class 3, Lab. 3, cr. 4.
Prerequisite: EET 482.
A study of difference equations, z-transforms, sample-hold circuits, sampling requirements, digital filters, and control algorithms applied to digital control systems.

EET 499. ELECTRICAL ENGINEERING TECHNOLOGY.
Cr. 1-9.
Hours and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

ENGLISH

ENGL 007. WRITING LABORATORY.
Class 0, Lab. 1, cr. 0.
Emphasis on patterns of organization and fundamentals of usage in composition for ENGL 104 students with an English Placement Score between 33 and 37.

ENGL 018. FUNDAMENTALS OF READING.
Class 3, cr. 0.
Aims to build the student's functional reading level to meet the requirements of college textbooks. Stresses improvement of the basic silent reading skills of word recognition, vocabulary building, literal comprehension and rate fluency. Some instruction in study techniques. Individualized and performance-oriented.

ENGL 019. ENGLISH COMPOSITION FOR ENGLISH AS A SECOND LANGUAGE (ESL) STUDENTS.
Class 3, Lab. 1, cr. 0.
English composition for those students whose command of English indicates a need for instruction in English as a second language. An equivalent of ENGL 020; however, students who acquire exit skills equivalent to those required for ENGL 104 receive ENGL 104 credit by departmental examination.

ENGL 020. FUNDAMENTALS OF WRITING.
Class 3, Lab. 1, cr. 0.
A review of writing fundamentals for those who need further training and practice. Emphasis will be on English grammar, punctuation, spelling, sentence structure, and paragraph organization.

ENGL 091. COOPERATIVE WORK EXPERIENCE I.
Cr. 0.
For cooperative education program students only.
Prerequisite: must be accepted for this program by the Cooperative Education Program Coordinator.

ENGL 092. COOPERATIVE WORK EXPERIENCE II.
Prerequisite: ENGL 091.

ENGL 093. COOPERATIVE WORK EXPERIENCE III.
Prerequisite: ENGL 092.

ENGL 094. COOPERATIVE WORK EXPERIENCE IV.
Prerequisite: ENGL 093.

ENGL 095. COOPERATIVE WORK EXPERIENCE V.
Prerequisite: ENGL 094.

ENGL 103. ADVANCED FRESHMAN COMPOSITION.
Class 3, cr. 3.
A composition course for freshmen who have shown their superior writing ability by their high school achievement and their score on the verbal section on the College Entrance Examination. The course emphasizes expository writing on a high critical level and includes readings of essays and imaginative literature involving conflicting intellectual attitudes as subjects for writing.

ENGL 104. ENGLISH COMPOSITION I.
Class 3, cr. 3.
Prerequisite for all credit courses in English except ENGL 103, 185 and 186.
ENGL 007, Writing Laboratory, is a corequisite for students with English Placement Scores between 33 and 37.
Emphasis on the organization of the expository theme. Directed writings of themes based on personal experience, on the relationship between experience and language, and on the relationship between experience and ideas.

ENGL 105. ENGLISH COMPOSITION II.
Class 3, cr. 3.
Not open to students who have earned a grade of C or higher in ENGL 103.
The second half of the basic composition sequence. Emphasis on the logical and rhetorical problems involved in writing discursive essays. Directed writing of themes based largely on reading of discursive prose and imaginative literature. Normally to be taken immediately following ENGL 104 in the freshman year.

ENGL 186. COLLEGE READING AND STUDY SKILLS.
Class 3, cr. 3.
Emphasizes development of effective textbook reading and review strategies, acquisition of college-level vocabulary, utilization of library resources, improvement of such classroom learning skills as lecture note-taking and test taking.

ENGL 201. THE NATURE OF LITERARY STUDY.
Class 3, cr. 3.
A study of literary concepts and critical procedures as applied to representative poetry, fiction, and drama, with practice in critical writing.

ENGL 210. GENDER AND STYLE IN LITERATURE.
Class 3, cr. 3.
This introductory course compares various kinds of discourse written by women with that written by men. Students will read paired works in such literary genres as the maturation novel, autobiography, personal essay, short stories, poetry, and drama. The class will explore the aesthetic, cultural, and experiential differences and commonalities evidenced by these writers. (Same as WOST 210)

ENGL 220. TECHNICAL REPORT WRITING.
Class 3, cr. 3.
A study of application of the principles of good writing in industrial reporting with emphasis on the techniques of presenting information graphically as well as in a clear, concise written form.

ENGL 230. GREAT NARRATIVE WORKS.
Class 3, cr. 3.
Not open to students with credit for ENGL 238.
Reading and discussion of major works in English, American, and continental literature.

ENGL 231. INTRODUCTION TO LITERATURE.
Class 3, cr. 3.
Reading and discussion of major works in English, American, and continental literature to develop an understanding of style, form, and ideas characteristic of great works. Emphasis on various types of literature.

ENGL 232. THEMATIC STUDIES IN LITERATURE.
Class 3, cr. 3.
(May be repeated for credit.)
Examination of a particular theme, such as the hero, death, or the city, and the techniques by which it is treated in various literary works, usually in more than one genre.

ENGL 238. INTRODUCTION TO FICTION.
Class 3, cr. 3.
Readings and discussion of selected short stories and several novels, to promote awareness, understanding, and appreciation of the range, values, techniques, and meanings of reputable modern fiction.

ENGL 240. SURVEY OF THE LITERATURE OF ENGLAND: FROM THE BEGINNINGS THROUGH THE NEOCLASSICAL PERIOD.
Class 3, cr. 3.
An introduction to English literature from the Anglo-Saxon age through the eighteenth century neoclassical period, with emphasis on such major writers as Chaucer, Spenser, Shakespeare (non-dramatic work), Donne, Milton, Dryden, Pope, and Johnson. The course also treats significant minor writers in their relation to literary movements and ideas.

ENGL 241. SURVEY OF THE LITERATURE OF ENGLAND: FROM THE RISE OF ROMANTICISM TO THE MODERN PERIOD.
Class 3, cr. 3.
A continuation of ENGL 240, this course surveys English literature (excluding the novel) from the late eighteenth century to the twentieth century, with emphasis on such major writers as Blake, Wordsworth, Keats, Tennyson, Arnold, Blake, Hardy, Yeats, T.S. Eliot, and Auden. The course also treats significant minor writers in

their relation to literary movements and ideas.

ENGL 250. GREAT AMERICAN BOOKS.
Class 3, cr. 3.
Several books, such as *The Scarlet Letter*, *Moby Dick,* and *Walden*, read and discussed as to their literary qualities and their cultural significance.

ENGL 254. GREAT BRITISH BOOKS.
Class 3, cr. 3.
An examination of great British works within the context of their intellectual, social, and literary traditions. Works such as *Hamlet*, *Gulliver's Travels*, *Pride and Prejudice*, and *To the Lighthouse* will be discussed.

ENGL 260. INTRODUCTION TO WORLD LITERATURE: TO 1800.
Class 3, cr. 3.
A comparison of some of the major works of world literature in translation, from the beginnings to 1800. Emphasis on Greek, Roman, Eastern and early European literature.

ENGL 261. INTRODUCTION TO WORLD LITERATURE: SINCE 1800.
Class 3, cr. 3.
A comparison of some of the major works of world literature in translation, from 1800 to present. Emphasis on Continental, African, Latin-American and Eastern literature.

ENGL 304. ADVANCED COMPOSITION.
Class 3, cr. 3.
Designed for students who wish additional training in composition beyond the basic requirements. Extensive practice in the writing of mature expository, critical, and argumentative prose.

ENGL 309. MODERN ENGLISH GRAMMAR
Class 3, cr. 3.
An introduction to the study of traditional, structural, and generative-transformational analyses of English. Some attention to new directions in grammatical description and application.

ENGL 310. INTRODUCTION TO POPULAR CULTURE.
Class 3, cr. 3.
A survey of mass culture, popular arts and media, including literature (dime novels and westerns), art and architecture (magazine illustrators and prefabricated housing), radio-TV-film, and music (ballads, jazz, rock), from mid-nineteenth century through present day. When appropriate, field trips will be scheduled.

ENGL 320. BY AND ABOUT WOMEN.
Class 3, cr. 3.
This literature course will emphasize significant texts by major women writers such as Atwood, the Brontes, Cather, Chopin, Dickinson, Eliot, Glaspell, Hurston, Jewett, Lessing, Mansfield, Morrison, Oates, Rich, and Woolf. Although the class will study mainly 19th and 20th century English and American writers, the readings will not be restricted to these. In addition, the readings will also include a variety of literary genres—novel, short fiction, poetry, and drama. (Same as WOST 320)

ENGL 327. ENGLISH LANGUAGE I: HISTORY AND DEVELOPMENT.
Class 3, cr. 3.
This course presents the basic facts of the historical development of the English language from its beginnings to the present. The major changes in the sounds of English, the growth of the lexicon, and the development of the grammatical system will be studied.

ENGL 328. ENGLISH LANGUAGE II: DESCRIPTION AND ANALYSIS.
Class 3, cr. 3.
The structure of contemporary American English, with emphasis on syntax, including parts of speech and sentence structure. Implications of recent study for the teaching of English.

ENGL 350. SURVEY OF AMERICAN LITERATURE FROM ITS BEGINNINGS TO 1865.
Class 3, cr. 3.
An introduction to American literature from the colonial period to the Civil War, emphasizing such major literary figures as Edward Taylor, Franklin, Poe, Hawthorne, Melville, Emerson, Thoreau, and Whitman. This course also treats significant minor writers in their relation to literary movements and ideas and includes the work of minority writers.

ENGL 351. SURVEY OF AMERICAN LITERATURE FROM 1865 TO THE POST WORLD WAR II PERIOD.
Class 3, cr. 3.
A continuation of ENGL 350, this course surveys American literature from the Civil War to recent times, emphasizing such major literary figures as Dickinson, Twain, James, Crane, Frost, T. S. Eliot, Fitzgerald, Hemingway, and Faulkner. The course also treats significant minor writers in their relation to literary movements and ideas and includes the work of minority writers.

ENGL 355. AFRO-AMERICAN LITERATURE.
Class 3, cr. 3.
An examination of the literary, social, and historical significance of major works of fiction, drama, poetry, and nonfiction by Afro-Americans. Readings will range from the earliest period to the present with attention, when appropriate, to the influence of folklore and music on literature.

ENGL 372. INTRODUCTION TO AMERICAN FOLKLORE.
Class 3, cr. 3.
Introduction to the study of Anglo-American traditions, folk tale, song, dance, humor, superstition, games, beliefs, etc. with emphasis on informal discussion of readings, recordings, movies, and lectures.

ENGL 373. SCIENCE FICTION AND FANTASY.
Class 3, cr. 3.
Representative works of science fiction and fantasy examined in relation to both mainstream and popular literature. Emphasis is on technique, theme, and form.

ENGL 376. THE MOVIES.
Class 2, Lab. 3, cr. 3.
The history and aesthetics of the movies from *The Great Train Robbery* and *The Birth of a Nation* or *Intolerance* to contemporary films. Comparison of the cinematic methods with the methods of the drama and the novel. One afternoon or evening a week for the screening of films; two periods a week for discussion.

ENGL 381. THE BRITISH NOVEL.
Class 3, cr. 3.
A survey of representative British novels of the eighteenth and nineteenth centuries by such authors as Defoe, Fielding, Austen, Dickens, Eliot, and Hardy.

ENGL 382. THE AMERICAN NOVEL.
Class 3, cr. 3.
A survey of representative American novels of the nineteenth and twentieth centuries by such authors as Cooper, Hawthorne, Melville, Twain, James and Faulkner.

ENGL 383. MODERN DRAMA: IBSEN TO THE ABSURDISTS.
Class 3, cr. 3.
A survey of major works of Continental, English, and American drama, including such authors as Ibsen, Chekhov, Shaw, O'Neill, and Beckett.

ENGL 384. INTRODUCTION MODERN DISCOURSE THEORY.
Class 3, cr. 3.
Explores various modern theories of writing with an emphasis on how a writer conceives of an idea and then translates that idea into an effective piece of written communication. This exploration will include a study of psycholinguistics, text linguistics, and discourse theory.

ENGL 386. HISTORY OF THE FILM TO 1938.
Class 3, Lab. 2, cr. 3.
Prerequisite: consent of instructor.
A survey of the American and European cinema from its origins in technology and realism to the aesthetic implications presented by the coming of sound. Emphasis on the feature film and on the prevalent aesthetic attitudes in the first decades of the motion picture.

ENGL 387. HISTORY OF THE FILM FROM 1938 TO THE PRESENT.
Class 3, Lab. 2, cr. 3.
Prerequisite: consent of instructor.
A survey of international cinema for the period indicated. Emphasis on the feature film and its development as a communication tool, popular art form, medium of personal expression, and self-exploring linguistic system.

ENGL 396. STUDIES IN LITERATURE AND LANGUAGES.
Class 3, cr. 3.
A course in the study of a special topic directed by an instructor in whose particular field of specialization the content of the course falls.

ENGL 403. LITERARY THEORY.
Class 3, cr. 3.
Prerequisite: completion of an upper-division literature course.
This seminar addresses three major concerns in the study of literature; the problem and the possibility of theory, the problems of canon, form and genre, and the problems of meaning and significance.

ENGL 405. CREATIVE WRITING.
Class 3, cr. 3.
(May be repeated for credit.)
Informally conducted for students who enjoy writing—of any kind except the narrowly technical—and concerned with problems of form, style, diction, sentence structure. Workshop criticism.

ENGL 420. BUSINESS WRITING.
Class 3, cr. 3.
Attention to purpose, readers, information, organization and style in on-the-job writing. Special emphasis on planning, drafting, and revising. Typical assignments: resumes, cover letters, proposals, progress reports, memos, letters, and research reports.

ENGL 423. TECHNICAL PUBLICATIONS WRITING.
Class 3, cr. 3.
Prerequisite: ENGL 105 or ENGL 220.
Designed to teach the student how to create software documentation, using contemporary management methods and the state-of-the-art capabilities of the personal computer.

ENGL 425. TECHNICAL PUBLICATIONS EDITING.
Class 3, cr. 3.
Prerequisite: ENGL 105.
An analysis and application of the principles of technical editing, including proofreading, copy editing, format editing, style, and content editing. Emphasis on levels of editing.

ENGL 429. SUPERVISED WRITING.
Class 3, cr. 3.
Special writing projects for students in the Writing Option. Individual conferences only; no class meeting.

ENGL 441. CHAUCER'S CANTERBURY TALES.
Class 3, cr. 3.
Critical reading of *The Canterbury Tales* in Middle English with attention to the literary and cultural background.

ENGL 442. SHAKESPEARE.
Class 3, cr. 3.
Shakespeare's dramatic craftsmanship, characterization, poetry, humor, psychology, and modern pertinence illustrated in representative tragedies, comedies, and history plays.

ENGL 444. MILTON'S MAJOR POETRY.
Class 3, cr. 3.
A study of Milton's major poetry, with particular emphasis upon *Paradise Lost* and *Samson Agonistes.*

ENGL 455. MAIN CURRENTS OF AMERICAN THOUGHT.
Class 3, cr. 3.
A survey of dominant ideas and intellectual trends in America from 1607 to the present as revealed through American literature and as related to American life and culture.

ENGL 456. AMERICAN HUMOR.
Class 3, cr. 3.
Humorous writings of the nineteenth and twentieth centuries are studied as to form and technique and also as a reflection of American life. Special emphasis on Mark Twain.

ENGL 462. THE BIBLE AS LITERATURE: THE OLD TESTAMENT EXCLUSIVE OF THE PROPHETS.
Class 3, cr. 3.
An analysis of the historical books of the Old Testament, other narratives, and the books of *Psalms, Proverbs,* and *Job,* with emphasis on comprehension.

ENGL 463. THE BIBLE AS LITERATURE: THE PROPHETS AND THE NEW TESTAMENT.
Class 3, cr. 3.
A study of the prophets and a large part of the New Testament, with emphasis on the continuity of religious ideas displayed in the Old and New Testaments.

ENGL 479. THE SHORT STORY.
Class 3, cr. 3.
An historical and critical study of nineteenth- and twentieth-century short stories—Irish, British, American, and Continental.

ENGL 480. INTERNSHIP IN WRITING.
Class 0, cr. 3.
To gain admission to the internship, the student must have a 5.0 GPA in all courses in the writing focus or consent of the instructor. At least 21 hours of this coursework must be completed prior to the internship. Assigned internships in business, industrial and other professional situations.

ENGL 491. COMPOSITION FOR ENGLISH TEACHING MAJORS.
Class 2, cr. 2.
Intensive practice in writing exposition and in annotating high school students' compositions.

ENGL 498. DIRECTED READING.
Cr. 1-3.
Admission by consent of instructor. (May be repeated for credit.)
Directs the reading of students with special interests. Guides students in profitable reading in subjects of their own choice. Individual conferences only—no class meeting.

ENGL 502. PRACTICUM IN TEACHING COLLEGE COMPOSITION.
Class 1, cr. 1.
(May be repeated for credit.)
Reading professional literature; preparing syllabi; evaluating student papers; leading discussion.

ENGL 506. INTRODUCTION TO ENGLISH AND GENERAL LINGUISTICS.
Class 3, cr. 3.
General study of language and linguistic theory with emphasis on English. Problems and methods in phonology, morphology, syntax, and semantics. Current techniques of linguistic analysis.

ENGL 510. HISTORY OF THE ENGLISH LANGUAGE.
Class 3, cr. 3.
Must be preceded by ENGL 506 or AUSL 530 or consent of instructor.
Introduction to theories of linguistic change and their application to the historical development of English from its beginnings.

ENGL 512. MODERN ENGLISH GRAMMAR.
Class 3, cr. 3.
Must be preceded by ENGL 506 or AUSL 580 or consent of instructor.
Introduction to English syntactic structure, syntactic argumentation, and syntactic theory. Emphasis on one current theory as primary theoretical framework, with other theories considered.

ENGL 531. THE ENGLISH NOVEL THROUGH 1800.
Class 3, cr. 3.
A study of such novelists as Defoe, Richardson, Field, Smollett, Sterne, and Austen.

ENGL 532. THE ENGLISH NOVEL IN THE NINETEENTH CENTURY.
Class 3, cr. 3.
A survey of fiction up to about 1900, including such novelists as Scott, Dickens, Thackery, the Brontes, Eliot, and Meredith.

ENGL 533. TUDOR LITERATURE.
Class 3, cr. 3.
Nondramatic literature of the English Renaissance up to 1603, particularly the Elizabethan. Representative selections in both prose and verse are studied, with special attention to Spenser, Sidney, and Shakespeare.

ENGL 534. SEVENTEENTH-CENTURY LITERATURE.
Class 3, cr. 3.
Nondramatic literature from 1603 to 1660. Particular emphasis upon such figures as Jonson, Donne, Marvell, and Herbert, with representative prose from Bacon, Browne, Burton, and others.

ENGL. 537. ENGLISH DRAMA TO 1642.
Class 3, cr. 3.
A survey of the English drama from the beginning, through Marlowe and Johnson, to the closing of the theaters (excluding Shakespeare).

ENGL 541. CHAUCER.
Class 3, cr. 3.
Intensive study of the development of Chaucer's literary work with consideration of his language, his sources, and various critical approaches to his poetry.

ENGL 542. SHAKESPEARE'S COMEDIES AND TRAGI-COMEDIES.
Class 3, cr. 3.
A study of the development of Shakespeare's comic art from the early comedies through the later comedies and tragi-comedies. Ten to 12 plays will be read.

ENGL 543. SHAKESPEARE'S TRAGEDIES AND HISTORY PLAYS.
Class 3, cr. 3.
A study of the early and mature tragedies, the English histories, and the Roman plays. Ten to 12 plays will be read.

ENGL 547. THE ROMANTIC MOVEMENT IN ENGLISH LITERATURE.
Class 3, cr. 3.
Principal writers of the Romantic movement (Burns to Keats), emphasizing Wordsworth; relation of the historical background to the thought and feeling of the writers concerned.

ENGL 548. VICTORIAN LITERATURE.
Class 3, cr. 3.
A survey of English poetry and prose from about 1832 to 1880.

ENGL 549. LATE VICTORIAN AND EDWARDIAN LITERATURE.
Class 3, cr. 3.
A study of the rebellion against Victorian conventions which characterized the period from 1880 to 1910. Such movements as aestheticism, decadence, symbolism, and naturalism are examined in the works of Hardy, Yeats, Butler, Wilde, and others.

ENGL 554. THE AMERICAN RENAISSANCE.
Class 3, cr. 3.
A survey of American literature from about 1820 to 1855, concluding with Melville.

ENGL 556. NINETEENTH-CENTURY AMERICAN FICTION.
Class 3, cr. 3.
Surveys the development of American fiction from its beginnings. Though representative works of all periods will be read, emphasis will be given to Hawthorne, Melville, Twain, and James.

ENGL 559. TWENTIETH-CENTURY AMERICAN LITERATURE.
Class 3, cr. 3.
A survey of major literary genres—poetry, fiction, drama, essays, and criticism since 1900.

ENGL 577. MODERN ENGLISH AND AMERICAN POETRY.
Class 3, cr. 3.
Critical study of twentieth-century novels and short stories, including works by such writers as James, Faulkner, and Hemingway.

ENGL 579. MODERN BRITISH FICTION.
Class 3, cr. 3.
Critical study of twentieth-century novels and short stories by such writers as Conrad, Lawrence, and Forster. Special attention is given to James Joyce's *Ulysses*.

ENGL 580. LITERATURE AND MODERN THOUGHT.
Class 3, cr. 3.
Readings in literature, philosophy, and social criticism, concentrated on the political, industrial, and scientific revolutions that have molded modern life and thought.

ENGL 581. ETHICAL PROBLEMS IN MODERN LITERATURE.
Class 3, cr. 3.
Chief ethical systems. Novels written by writers with contrasting ethical assumptions. Ethical problems considered both abstractly and concretely.

ENGL 584. LITERATURE AND PSYCHOLOGICAL PROBLEMS.
Class 3, cr. 3.
Novels, stories, plays, and other types of literature dealing with important psychological problems, to show how great imaginative writers have treated problems of human relationship with which contemporary psychology is concerned.

ENGL 589. DIRECTED WRITING.
Cr. 1-3.
Prerequisite: consent of the instructor.
(May be repeated for credit.)
Writing—creative, popularly technical, biographical, historical, philosophical—on subjects of the student's choice. Individual conferences only. No class meetings.

ENGL 590. DIRECTED READING.
Cr. 1-3.
Admission by consent of instructor.
(May be repeated for credit.)
Directs the reading of students with special interests. Guides students in profitable reading in subjects of their own choice. Individual conferences; no class meetings.

ENGL 593. CONTEMPORARY BRITISH FICTION.
Class 3, cr. 3.
Critical study of the British novel since World War II. Survey of scholarship and criticism. Examinations and critical papers.

ENGL 594. CONTEMPORARY POETRY.
Class 3, cr. 3.
American and foreign poetry of the past two decades. Attention to influences, "schools," and poetry magazines. Outside reading. Critical papers.

ENGL 595. CONTEMPORARY AMERICAN FICTION.
Class 3, cr. 3.
Study of fiction of the past two or three decades as it relates to American literary traditions and thought. Survey of scholarship and criticism. Examinations and critical papers.

ENGL 596. ADVANCED STUDIES IN LITERATURE AND LANGUAGE.
Class 3, cr. 3.
A course in the study of a special topic directed by an instructor in whose particular field of specialization the content of the course falls. Emphasis on critical analysis, scholarly techniques, and secondary materials.

ENGL 602. INTRODUCTION TO LITERARY METHODS.
Class 3, cr. 3.
Introduction to the methods of literary study, including investigation of significant critical modes, bibliographic techniques, and research paper writing.

ENGL 691. SEMINAR IN THE ENGLISH LANGUAGE ARTS.
Class 3, cr. 3.
(May be repeated for credit with the permission of the instructor.)
Problems in the teaching of English: literature, language, rhetoric. Attention to recent scholarship and to its application in the public schools.

ENGL 696. SEMINAR IN LITERATURE.
Class 3, cr. 3.
Advanced study of special subjects.

ENGL 698. RESEARCH.
M. A. Thesis.

ENGINEERING

ENGR 114. ENGINEERING DRAWING.
Lab. 6, cr. 2.
A technical drawing course covering geometric constructions, pictorial and multiview drawing, sections, graphical vector solutions, dimensioning, detail and assembly drawings. Development of freehand sketching techniques as well as the use of drafting instruments.

ENGR 140. INTRODUCTORY ENGINEERING I.
Class 1, cr. 1.
An introduction to the engineering profession, survival techniques, and an introduction to computer programming using the FORTRAN programming language. The organization of programming logic which is applicable to FORTRAN as well as all other computer languages. The basics of the FORTRAN language will be treated and a number of examples and engineering applications will be used to illustrate programming techniques.

ENGR 160. INTRODUCTORY ENGINEERING II.
Class 1, cr. 1.
Prerequisite: ENGR 140.
Further lectures on the engineering profession and a continuation of computer programming techniques using FORTRAN. Emphasis on engineering applications.

ENGR 190. ELEMENTARY ENGINEERING DESIGN.
Class 1, Lab. 3, cr. 2.
An introduction to engineering design.

ENGR 233. MICROCOMPUTERS IN ENGINEERING.
Class 2, Lab. 3, cr. 3.
Prerequisites: EE 201, EE 207, and a high level computer language.
An introduction to microcomputers and microcontrollers with emphasis on single board embedded systems; gates, memory, microcomputer hardware, data representation, programming, input/output, interfacing, analog to digital conversion, digital to analog conversion, transducers, sensors, actuators, and the design and development of turnkey systems.

ENGR 325. DYNAMICS OF PHYSICAL SYSTEMS.
Class 3, cr. 3.
Prerequisites: EE 202, ME 275.
Analytical models of physical elements and systems; linearization and superposition. Natural and forced response for mechanical, electrical, and other physical systems. Dynamic characteristics and stability of systems; state variable methods and S-plane analysis. Convolution, Fourier, and Laplace techniques.

ENGR 380. COMPUTERS IN ENGINEERING ANALYSIS.
Class 2, Lab. 3, cr. 3.
Prerequisites: ENGR 160 or equivalent, EE 201, EE 207, MA 262, ME 275.
Theory and application of analog, digital, and hybrid simulation in the solution and analysis of engineering problems. Development of mathematical models suitable for computer solutions, and numerical analysis techniques will be discussed and applied.

ENGR 440. SENIOR ENGINEERING DESIGN I.
Class 1, Lab. 3, cr. 2.
Prerequisite: Must have completed option requirements of Junior Year.
See ENGR 460-Senior Engineering Design II.

ENGR 460. SENIOR ENGINEERING DESIGN II.
Class 1, Lab. 6, cr. 3.
Prerequisite: ENGR 440.
The senior engineering design courses I and II constitute a two-semester sequence of an interdisciplinary activity. The objective of these courscs is to provide engineering students with supervised experience in the process and practice of engineering design. Projects are chosen by the students or the faculty. Students working in teams pursue an idea from conception to realistic design. The course is climaxed by the presentation of a substantial written report and a formal oral presentation before faculty and students.

ENGR 483. INTRODUCTION TO CONTROL SYSTEMS.
Class 3, cr. 3.
Prerequisite: ENGR 325.
Introduction to classical control theory. Review of Laplace Transforms, transfer functions, block diagram manipulation, time domain and S-plane characteristics. System stability. Root locus analysis and design. Bode analysis and design. Compensation. Introduction to state-space formulation.

ENGR 495. SELECTED TOPICS IN ENGINEERING.
Cr. 1-6.
Available upon arrangement with the head of the department. May be repeated for credit.

FOODS AND NUTRITION

F&N 203. FOODS: THEIR SELECTION AND PREPARATION.
Class 2, Lab. 3, cr. 3.
Credit not given for both F&N 203 and F&N 205.
Principles of food selection, preparation, and meal planning.

F&N 205. FOOD SCIENCE I.
Class 1, Lab. 5, cr. 3.
Prerequisite: CHM 111 or equivalent; prerequisite or corequisite CHM 112 or equivalent. Credit not given for both F&N 203 and 205.
Chemical and physical composition of foods: their changes during processing, storage and preparation.

F&N 260. NUTRITION FOR PRESCHOOL AND ELEMENTARY EDUCATORS.
Class 3, cr. 3.
This course does not satisfy the nutrition competency for Early Childhood Education, Elementary Education, Nursing, or RHI majors.
Study of the basic principles of food and nutrition from pregnancy through the adolescent years and methods to achieve good nutritional status. Special emphasis on nutrition education, legislation, and regulation in pre-school and elementary classrooms.

F&N 261. NUTRITION FOR HEALTH, FITNESS, AND SPORTS
Class 2, Lab. 2, cr. 3.
This course does not satisfy the nutrition competency for Early Childhood Education, Elementary Education, Nursing, or RHI majors.
Study of the relationship between physical fitness/sports activity and nutrition resulting in optimum health. Special emphasis on nutritional demands during exercise or sports activities. Laboratory experience in the Fitness Center required.

F&N 303. ESSENTIALS OF NUTRITION.
Class 3, cr. 3.
Credit not given for both F&N 303 and F&N 315
Basic nutrition and its application in meeting nutritional needs of all ages.

F&N 315. FUNDAMENTALS OF NUTRITION.
Class 3, cr. 3.
Prerequisite: organic chemistry and physiology.
Credit not given for both F&N 303 and F&N 315.
Basic principles of nutrition and their applications in meeting nutritional needs during the life cycle.

F&N 330. DIET SELECTION AND PLANNING.
Class 3, cr. 3.
Prerequisite: F&N 203 or 205, and 303 or 315.
Diet selection for health maintenance throughout the life cycle based on current dietary guides with utilization of the computer for diet evaluation.

F&N 360. NUTRITION FOR THE AGING.
Class 3, cr. 3.
Nutritional needs and problems of the aging. Includes a review of community and institutional nutrition and food programs. Emphasis on the aging and their environment. Participation in community activities for the aging may be required.

F&N 590. SPECIAL PROBLEMS IN FOOD SCIENCE.
Cr. 1-4.
Credits and hours to be arranged. Instructor designation required.
Individual research problems dealing with various aspects of research in the food sciences.

FOREIGN LANGUAGES AND LITERATURES

FLL 020. FOUNDATIONS OF FOREIGN LANGUAGE LEARNING.
Class 3, cr. 0.
A presentation of the principles which function in the daily use of language, such as structure, relationships between sounds and meaning, form and function of words, syllables and stress. An examination of basic linguistic habits, dialectical differences and levels of speech in any community. The classification of language elements. How we learn our own language and how we learn others.

FLL 464. COMPARATIVE STUDY OF MODERN LANGUAGES.
Class 3, cr. 3.
An examination of French, German and Spanish phonology, syntax and morphology. Representative presentations of historical and contemporary descriptive consid- erations of these languages.

FLL 490. SPECIAL TOPICS.
Cr. 1-4.
An undergraduate course in special, individual assignments in literature or general linguistic topics related to French, German or Spanish; such topics are mutually chosen by student and professor. This course may be repeated once for credit, providing topics are different.

FRENCH

FR 101. FRENCH LEVEL I.
Class 3, Lab. 1, cr. 3.
Introduction to French.

FR 102. FRENCH LEVEL II.
Class 3, Lab. 1, cr. 3.
Prerequisite: FR 101.
Continuation of FR 101.

FR 201. FRENCH LEVEL III.
Class 3, cr. 3.
Prerequisite: FR 102 or equivalent.
A conversational approach to the culture of France with a review of French language skills as needed.

FR 202. FRENCH LEVEL IV.
Class 3, cr. 3.
Prerequisite: FR 201 or equivalent.
Continuation of FR 201 and the presentation of intellectual readings.

FR 230. MODERN FRENCH AUTHORS IN TRANSLATION.
Class 3, cr. 3.
Reading and analysis of major French writers of the modern period with particular emphasis on the evolution of literary genres in relation to cultural, political, and social trends. Knowledge of French not required.

FR 261. FRENCH COMPOSITION.
Class 3, cr. 3.
Prerequisite: FR 202 or may be taken concurrently with FR 202 with instructor's approval.
The essentials of French grammar as applied in composition.

FR 307. COMMERCIAL FRENCH.
Class 3, cr. 3.
Prerequisite: FR 202 or equivalent.
This course will provide students with the fundamentals of effective expression and communication as these apply to French business situations in particular. It will concentrate on commercial vocabulary, reading, writing and speaking as related to international business.

FR 350. HISTORY AND CULTURE OF FRENCH CUISINES.
(In English)
Class 3, cr. 3.
Does not satisfy requirements for language majors and minors.
This is a study of the historical and cultural development of French cuisine as it evolved to its present status.

FR 365. FRENCH CONVERSATION.
Class 3, cr. 3.
Prerequisite: FR 202 or may be taken concurrently with FR 202 with instructor's approval.
Intensive practice in French conversation. Pattern practice, preparation and delivery of dialogues and topical talks. Introduction to basic phonetics and practice in pronunciation.

FR 405. INTRODUCTION TO FRENCH LITERATURE I.
Class 3, cr. 3.
Prerequisite: FR 202.
Introduction to the periods of French literature from the beginning through the eighteenth century. Reading and discussion of representative works. The rudiments of literary criticism.

FR 406. INTRODUCTION TO FRENCH LITERATURE II.
Class 3, cr. 3.
Prerequisite: FR 202.
Introduction to the periods of French literature from the late eighteenth century to the present time. Reading and discussion of representative works. The rudiments of literary criticism.

FR 408. LANGUAGE PRACTICUM IN BUSINESS.
Class 3.
Prerequisites: completion of 261, 307, 365 with B or better, classification 5 or higher; GPA 4.5; and departmental approval.
(May be repeated once for credit if the experience is different.)
The course will consist of on-the-job experience in international corporations, industry, commerce, government, or health and social agencies where French is used. The course is designed to expose students to their chosen vocational field.

FR 450. FRENCH CIVILIZATION.
Class 3, cr. 3.
The study of modern French life with emphasis on the customs and daily life of the people. Lectures in the language.

FR 461. INTERMEDIATE FRENCH COMPOSITION.
Class 3, cr. 3.
Prerequisite: FR 261.
A continuation of FR 261. In this course, stress is given to the development of more complex grammar and its application in the written language. Emphasis is placed on the structure of composition and basic refinement and precision brought about by grammar and vocabulary.

FR 465. INTERMEDIATE FRENCH CONVERSATION.
Class 3, cr. 3.
Prerequisite: FR 365.
Continued and more advanced practice in French conversation and study of phonetics for accuracy in pronunciation and intonation. Students are encouraged to study contemporary French culture as a basis for their conversations.

FR 490. TOPICS IN FRENCH.
Class 3, cr. 3.
Variable title.
Prerequisite: FR 202, or permission of instructor.
(May be repeated for credit.)

FR 511. ADVANCED FRENCH CONVERSATION.
Class 3, cr. 3.
Prerequisite: FR 465.
Additional practice in speaking and understanding French. Talks based on material given in class.

FR 515. ADVANCED FRENCH COMPOSITION.
Class 3, cr. 3.
Prerequisite: FR 261 or consent of instructor.
Additional training in writing French.

FR 542. THE CLASSICAL AGE.
Class 3, cr. 3.
Prerequisite: FR 405.
The social background and the formation of classical traits of seventeenth century in France. Readings from Corneille, Racine, Moliere and minor authors.

FR 555. CONTEMPORARY FRENCH THEATRE.
Class 3, cr. 3.
Prerequisite: FR 406.
Readings and discussion of works in the twentieth-century theatre. Cocteau, Giraudoux, Montherlant, Claudel, Sartre, Camus, Anouilh, Ionesco, Beckett, Genet.

FR 558. FRENCH NOVEL OF THE TWENTIETH CENTURY.
Class 3, cr. 3.
Prerequisite: FR 406.
Contemporary novel as an insight into twentieth-century French life. Analysis of works by selected authors.

FR 581. FRENCH CULTURE.
Class 3, cr. 3.
Development of the cultural life of the French people as reflected in architecture, art, history, literature, music, and philosophy. Lectures in French.

FR 590. DIRECTED READING IN FRENCH.
Cr 1-4.
Prerequisite: consent of head of department.
(May be repeated for credit.)

GEOSCIENCES

GEOS 100. FRONTIERS IN GEOSCIENCES.
Class 3, cr. 3.
Recommended for both science and nonscience students.
A description of the combination of physical processes, natural laws,

and interactions with man which serve to influence the changing character of the earth and its neighbors in space. A survey of current efforts by geoscientists to expand their understanding of man's environment.

GEOS 110. SURVEY OF GEOLOGY.
Class 2, Lab. 3, cr. 3.
Not available for credit to students with credit in GEOS 111.
A survey of concepts, methods, and materials of physical and historical geology of professional and cultural interest to students who do not need the rigorous treatment of GEOS 111 or 112. Laboratory will illustrate the methods and materials used in geologic studies.

GEOS 220. SURVEY OF PHYSICAL GEOGRAPHY.
Class 2, Lab. 3, cr. 3.
A study of landforms, climates, soils, and resources that comprise the world's natural environments; includes the elements of cartography and geodetic measurements.

GEOS 361. INTERMEDIATE ASTRONOMY I.
Class 3, cr. 3.
Prerequisite or corequisite: PHYS 251, MA 164, or consent of instructor.
Intermediate level introduction to solar system, astronomical instruments, radio astronomy, celestial mechanics, and space research for science students. Not available for credit to students with credit in GEOS 262.

GEOS 362. INTERMEDIATE ASTRONOMY II.
Class 3, cr. 3.
Prerequisite or corequisite: PHYS 251, MA 164, or consent of instructor.
Intermediate level introduction to stellar astronomy and astrophysics, including physical properties of stars and sun, variable stars, pulsar, Milky Way galaxy, external galaxies, quasars, and cosmology. Not available for credit to students with credit in GEOS 262.

GEOS 443. EARTH CHEMISTRY.
Class 3, cr. 3.
Prerequisites: CHM 374 or equivalent.
Structure and composition of the earth. Geochronology and Isotope Geology. Distribution of the elements in the Earth's lithosphere, biosphere, hydrosphere, and atmosphere. The Geochemical Cycle and rock-forming processes.

GERMAN

GER 101. GERMAN LEVEL I.
Class 3, Lab. 1, cr. 3.
Introduction to German.

GER 102. GERMAN LEVEL II.
Class 3, Lab. 1, cr. 3.
Prerequisite: GER 101.
Continuation of GER 101.

GER 201. GERMAN LEVEL III.
Class 3, cr. 3.
Prerequisite: GER 102 or equivalent.
A conversational approach to the culture of Germany with a review of German language skills as needed.

GER 202. GERMAN LEVEL IV.
Class 3, cr. 3.
Prerequisite: GER 201 or equivalent.
A continuation of GER 201 and the presentation of intellectual readings.

GER 230. GERMAN LITERATURE IN TRANSLATION.
Class 3, cr. 3.
Reading and analysis of selected German writers and their works with particular emphasis on the social, political, and intellectual climate of the times. The course content will change from semester to semester. Knowledge of German not required.

GER 244. FOURTH COURSE IN SCIENTIFIC GERMAN.
Class 3, cr. 3.
Prerequisite: GER 201.
Credit will not be given for both GER 202 and 244.

GER 261. GERMAN COMPOSITION.
Class 3, cr. 3.
Prerequisite: GER 202 or may be taken concurrently with GER 202 with instructor's approval.
The essentials of German grammar as applied in composition.

GER 307. COMMERCIAL GERMAN.
Class 3, cr. 3.
Prerequisite: GER 202 or equivalent.
This course will provide students with the fundamentals of effective expression and communication as these apply to German business situations in particular. It will concentrate on commercial vocabulary, reading, writing, and speaking as related to international business.

GER 365. GERMAN CONVERSATION.
Class 3, cr. 3.
Prerequisite: GER 202 or may be taken concurrently with GER 202 with instructor's approval.
Intensive practice in German conversation. Pattern practice, preparation and delivery of dialogues and topical talks. Introduction to basic phonetics and practice in pronunciation.

GER 405. INTRODUCTION TO GERMAN LITERATURE I.
Class 3, cr. 3.
Prerequisite: GER 202.
Survey of German literature from the beginning through the eighteenth century. Reading and discussion of representative works and the fundamentals of literary criticism.

GER 406. INTRODUCTION TO GERMAN LITERATURE II.
Class 3, cr. 3.
A continuation of GER 405 covering the basic German literature survey from the eighteenth century to the present time.

GER 408. LANGUAGE PRACTICUM IN BUSINESS.
Prerequisite: completion of 261, 307, 365 with B or better; classification 5 or higher, GPA 4.5; and departmental approval.
(May be repeated once for credit if the experience is different.)
The course will consist of actual on-the-job experience in international corporations, industry, commerce or government where German is used. The course is designed to expose students to their chosen vocational field.

GER 450. GERMAN CIVILIZATION.
Class 3, cr. 3.
The study of modern German life with emphasis on the customs and daily life of the people. Lectures in the language.

GER 461. INTERMEDIATE GERMAN COMPOSITION.
Class 3, cr. 3.
Prerequisite: GER 261.
A continuation of GER 261. In this course, stress is given to the development of more complex grammar and its application in the written language. Emphasis is placed on the structure of composition and basic refinement and precision brought about by grammar and vocabulary.

GER 465. INTERMEDIATE GERMAN CONVERSATION.
Class 3, cr. 3.
Prerequisite: GER 365.
Continued and more advanced practice in German conversation and the study of phonetics for accuracy in pronunciation and intonation. Students are encouraged to study contemporary German culture as a basis for their conversations.

GER 490. TOPICS IN GERMAN.
Class 3, cr. 3.
Prerequisite: GER 202 or permission of instructor.
(May be repeated for credit.)
Variable title.

GER 511. ADVANCED GERMAN CONVERSATION.
Class 3, cr. 3.
Prerequisite: GER 465.
Additional practice in speaking and understanding German. Talks based on material given in class.

GER 515. ADVANCED GERMAN COMPOSITION.
Class 3, cr. 3.
Prerequisite: GER 261 or consent of instructor.
Additional training in writing German.

GER 545. GERMAN PROSE FROM NATURALISM TO THE PRESENT.
Class 3, cr. 3.
Prerequisite: GER 406.
Development of the novel and short story of the period with special emphasis on the major authors.

GER 546. GERMAN LITERATURE SINCE 1945.
Class 3, cr. 3.
Prerequisite: GER 406.
Major literary movements and tendencies in East and West Germany, Austria, and Switzerland since 1945. Involves the close reading of literary texts, investigation of major problems addressed by literary criticism, and discussion of historical context.

GER 555. GERMAN DRAMA FROM NATURALISM TO THE PRESENT.
Class 3, cr. 3.
Prerequisite: GER 406.
Development of the drama through the various literary movements of the period, including consideration of the underlying social and ideological forces.

GER 556. THE GERMAN NOVELLE.
Class 3, cr. 3.
Prerequisite: GER 406.
A survey of the development of the Novelle, a literary genre which presents Germany's unique contribution to the European literature of the nineteenth century.

GER 581. GERMAN CULTURE.
Class 3, cr. 3.
The development of the cultural life in German-speaking lands as reflected in architecture, art, history, literature, music, and philosophy. Lectures in German.

GER 590. DIRECTED READING IN GERMAN.
Cr. 1-4.
Prerequisite: consent of head of department.
(May be repeated for credit.)

GENERAL STUDIES (SCHOOL OF LAS)

G S 121. INTRODUCTION TO WOMEN'S STUDIES.
Class 3, cr. 3.
An introduction to a women's studies perspective in various academic disciplines. Emphasis on the socialization process of women, the history and literature of women, the politics and theory of the women's rights movement, and the changing role of women in society. (Same as WOST 121)

G S 480. LAS SENIOR HONORS PROJECT.
Class 3, cr. 3.
Prerequisites: IDIS 102, IDIS 103, at least three credits of departmental honors courses, and a classification of 7.
A senior-level interdisciplinary colloquium for LAS honors students in which such students shall undertake individual research projects which shall be presented to the colloquium for critical evaluation.

GENERAL STUDIES

GNS 100. ACADEMIC DEVELOPMENT I.
Class 3, cr. 3.
Designed to assist and guide students in maximizing their potential for success at the University. An intensive review of academic goal-setting strategies, study techniques and skills, individual learning styles, motivation, memory, and retention techniques designed to help students develop effective strategies for achieving academic success. An orientation to campus facilities, services and opportunities at the University is also provided. This course is required of all students in the Developmental Program.

GNS 101. ACADEMIC DEVELOPMENT II.
Class 3, cr. 3.
Prerequisite: GNS 100.
This course promotes academic growth and development and assists students in making decisions regarding life plans. Information, testing and discussions involving self-awareness and career development will be emphasized. Emphasis is also placed on problem-solving strategies, career exploration, and relationships of academic planning to life goals.

GNS 160. INTRODUCTION TO CHEMISTRY.
Class 2, Lab. 3, cr. 3.
A survey of modern chemistry using everyday examples and contemporary experiments to illustrate the general theories and unifying concepts. The subject matter is so widely diversified that those desiring to continue will be prepared to successfully complete chemistry courses required for careers in health, agriculture, industry, energy, transportation, conservation, or other fields.

GNS 290. TOPICS FOR STUDY.
Cr. 1-3.
Variable credit, variable title course for group or individual study.

HISTORY

HIST 104. INTRODUCTION TO THE MODERN WORLD.
Class 3, cr. 3.
Traces the expansion of Europe into the Americas, Africa, and Asia. The French Revolution, nationalism, and the development of western European states from the era of the Reformation to the present are studied.

HIST 110. THE PRE-MODERN WORLD.
Class 3, cr. 3.
A survey of the ancient and medieval periods from late prehistoric times to the 17th century. Major emphasis is placed on ancient civilizations, the development and flowering of medieval political, religious, economic and cultural institutions in Western and non-Western societies; and the dawn of modern times.

HIST 151. AMERICAN HISTORY TO 1877.
Class 3, cr. 3.
A study of the development of American political, economic, and social institutions from the early explorations and Colonial settlements through Reconstruction.

HIST 152. UNITED STATES SINCE 1877.
Class 3, cr. 3.
A study of the growth of the United States from 1877 to the present. The new industrialism, agrarian problems, depression, the New Deal, the two world wars, the cold war, and similar topics are analyzed.

HIST 261. THE WORLD OF IDEAS I.
Class 3, cr. 3.
The first half of a two-semester chronological sequence based on reading and discussing source materials and documents drawn from Political Science, Economics, History, Sociology, Psychology, and Philosophy. This course is designed to familiarize students with the major ideas and ideals which have shaped world civilization. Major themes of this course are Liberty, Human Nature, and the Individual and Society.

HIST 262. THE WORLD OF IDEAS II.
Class 3, cr. 3.
The second half of a two-semester chronological sequence based on reading and discussing primary source materials and documents drawn from Political Science, Economics, History, Sociology, Psychology, and Philosophy. This course is designed to familiarize students with the major ideas and ideals which have shaped world civilization. Major themes of this course are Liberty, Human Nature, and The Individual and Society.

HIST 272. LATIN AMERICAN HISTORY FROM 1824.
Class 3, cr. 3.
A survey of Latin American History from independence to the present with particular attention to political, economic, and social problems connected with modernization.

HIST 301. EPISODES IN AMERICAN RELIGIOUS HISTORY.
Class 3, cr. 3.
Introduces students to the study of religion in the United States by focusing on particular groups or movements. Each religious episode is placed in the appropriate historical context and in relation to other religious experiences and expressions. Subjects vary but could include Puritanism, Mormonism, and twentieth-century popular religion.

HIST 311. WORLD WAR II AND HOLLYWOOD.
Class 2, Lab. 3, cr. 3.
Hollywood films about World War II combined patriotism and the glories of the American way of life with anti-Nazi and anti-Japanese propaganda. These films sought to convey the experiences of war, the courage, the brutality, and the clear contrast between good and evil. By studying these films one can more clearly understand the American mind of the 1940's, something of the excitement and need of a common experience that became central to the lives of the American peoples.

HIST 322. MONARCHY: ITS RISE AND FALL.
Class 3, cr. 3.
This course will trace the rise and fall of Europe's great monarchs and monarchies from the Renaissance to the 20th Century. The craft of kingship and the institution of monarchy will be examined. Major topics will include the Renaissance Prince and State, the evolution of absolute monarchy and enlightened despotism to the royalty of national and multi-national states in the 19th and 20th centuries.

HIST 325. HISTORY OF CRIME IN AMERICA.
Class 3, cr. 3.
A study of the history of crime in American from the 19th century to the present. Emphasis will be placed on violent crime, the public's response to it, and the cultural expressions of crime through literature and the popular media.

HIST 334. SCIENCE AND TECHNOLOGY IN WESTERN CIVILIZATION II.
Class 3, cr. 3.
A survey of some of the main features of the historical development of science and technology in the western world from Newton to the present. Emphasis is placed upon the relation between the achievements of individual investigators and the major aspects of the society and culture in which they lived.

HIST 336. HISTORY OF ORGANIZED CRIME IN AMERICA.
Class 3, cr. 3.
An examination of the evolutionary process leading to the complex social phenomenon of organized crime. Emphasis will be placed upon the rise of gangs, the Mafia mystique, the immigrant and crime, and the cultural expressions of organized crime through literature and the popular media.

HIST 365. WOMEN IN AMERICA.
Class 3, cr. 3.
A survey of the history of women in America from Colonial times to the present. Emphasis is on changing status of women, social and cultural influences, movements for women's rights and women's contributions to American society. (Same as WOST 365)

HIST 370. THE HOLOCAUST.
Class 3, cr. 3.
A survey of the Holocaust from 1933 to 1945. The course includes analysis and historical descriptions of such topics as the background and nature of Nazi racism, Nazi persecution from 1933 to 1941, the "Final Solution" from 1941 to 1945, the concentration camp experience, resistance, the apathy and indifference of bystanders, rescue efforts, assessment of the significance of the Holocaust, and historical interpretation of the Holocaust.

HIST 374. UNITED STATES ECONOMIC HISTORY.
Class 3, cr. 3.
(Also ECON 375)
A study of the growth of the American economy from colonial times to the late nineteenth century. Emphasis is placed on the application of the tools of economic analysis to historical questions concerning the sources and rate of growth, the relationships between growth and structural and institutional change, and the impact of industrialization of the quality of life in the American economy.

HIST 376. HISTORY OF INDIANA.
Class 3, cr. 3.
Economic, political, and social history of Indiana from the state's earliest beginnings as a part of the old Northwest Territory to the present.

HIST 397. THE AFRO-AMERICAN.
Class 3, cr. 3.
A survey of the history of the Afro-Americans in the United States from their African background to the present. Emphasis is placed upon the changing economic, social, and political status of Afro-Americans in the United States, and

upon their contributions to American society.

HIST 461. THE REVOLUTIONARY ERA, 1763 TO 1800.
Class 3, cr. 3.
An analysis of the origins, nature, and consequences of the American Revolution; of the achievements and difficulties of the new national under the Articles of Confederation; of the drafting and adoption of the Constitution; and the initial political, economic, and social progress of the United States under the Federalists.

HIST 490. TOPICS IN AMERICAN HISTORY.
Class 3, cr. 3.
Variable title.
(May be repeated for credit) Sophomore standing and a history survey course.

HIST 510. THE AGE OF ABSOLUTE MONARCHY, 1600-1789.
Class 3, cr. 3.
The Age of Absolute Monarchy will study the Reformation and the great revolutionary upheavals of the late eighteenth century.

HIST 513. MODERN EUROPE, 1789-1850.
Class 3, cr. 3.
This course will focus on the major themes of the era 1789-1859: The French revolution, the ascendancy of France in Europe, and the reaction to that hegemony.

HIST 514. A HISTORY OF WESTERN THOUGHT I.
Class 3, cr. 3.
Intellectual and cultural development of the western world to the end of the Middle Ages.

HIST 515. A HISTORY OF WESTERN THOUGHT II.
Class 3, cr. 3.
Intellectual and cultural development of the western world from the Renaissance to the present.

HIST 525. PROBLEMS IN TWENTIETH-CENTURY GERMAN HISTORY.
Class 3, cr. 3.
A study in depth of three major periods of German history in this century: pre-1914, the Weimar Republic, and the Third Reich. Emphasis is placed on the transformation which occurred in German society as a result of the upheavals of this century.

HIST 535. MODERN EUROPE, 1850-1914.
Class 3, cr. 3.
The period to be covered in this course are those years which are regarded as the zenith of European civilization: 1850-1914. The structure is both chronological and topical.

HIST 538. SOCIAL AND CULTURAL, HISTORY OF MODERN RUSSIA.
Class 3, cr. 3.
A survey of family policies, education, the relationship of ethnic minorities to the state, the role and status of artists, and questions of social stratification the Soviet Union since 1917.

HIST 552. EUROPE SINCE 1914.
Class 3, cr. 3.
This course will concentrate on political, social, economic, and intellectual legacies of the two world wars. Special emphasis will be placed upon the structure of peace and security from 1919 through the Cold War. The present status of East-West relations will be considered.

HIST 553. COLONIAL AMERICAN, 1600-1776.
Class 3, cr. 3.
A study of the expansion of Europe, the age of exploration and discover, and the establishment of colonies in the New World. Particular attention will be paid to the emergence of an American culture during the seventeenth and eighteenth centuries, the nature of the British Empire, and the emergence of dissent and revolution.

HIST 554. THE ERA OF SECTIONALISM, 1820-1865.
Class 3, cr. 3.
This course will concentrate on the rise to domination of those forces and factors that led to a disastrous Civil War: slavery and anti-slavery, economic jostling among the sections, expansionism, the creation of false sectional stereotypes, and the rise of hostile sectional parties. The Civil War will be analyzed in military and political terms.

HIST 555. THE EMERGENCE OF MODERN AMERICA, 1865-1916.
Class 3, cr. 3.
An examination of the nation that emerged emotionally exhausted from a civil war. The interaction of a flourishing industrial establishment, floods of immigrants, rapid urbanization, and smoldering racism combined to transform ante bellum America into a complex and relatively sophisticated society during those years. Emphasis will be placed upon an analysis of these forces and the men who tried to control them.

HIST 562. ENVIRONMENTALISM IN UNITED STATES HISTORY.
Class 3, cr. 3.
A survey of the differing perspectives, attitudes, and values with which Americans have perceived and acted toward, upon, and within their physical environment from the late 18th century to the present.

HIST 564. MODERN AMERICA, 1917-PRESENT.
Class 3, cr. 3.
A history of the United States from the first World War to the present; the political, social, economic, diplomatic, and intellectual developments in America during those years will be examined in their world context.

HIST 569. HISTORY OF THE AMERICAN SOUTH.
Class 3, cr. 3.
This course will stress those political and social traits that make the region between the Potomac and Rio grand rivers a cultural province conscious of its identity. This regional course will focus on those differences which made the South a unique region and the interrelations between the South and the nation of which it was a part. Half of the course will deal with the major events in the South's history after the Civil War, especially dealing with industry, agriculture, and the rise and fall of Jim Crow.

HIST 575. THE AMERICAN FRONTIER.
Class 3, cr. 3.
This course will involve study of the nature and importance of the westward movement in American history from the Revolution to the twentieth century. The westward movement will be treated in its varied aspects. Emphasis will be placed upon social and economic aspects as well as upon the spread of government. Although the Turner thesis will be discussed, no attempt will be made to pursue a thesis.

HIST 582. THE ART OF HISTORY.
Class 3, cr. 3.
A balanced presentation of the art of studying, understanding, researching, and writing history. It

will present a balanced view of problems in American and European historiography; causality and methodology will be emphasized. Careful attention will be paid to research methods, the mechanics of citation, the use of the University library, and writing style.

HIST 584. SOCIAL HISTORY OF THE UNITED STATES.
Class 3, cr. 3.
Social and cultural development of the American people since the late eighteenth century.

HIST 586. UNITED STATES FOREIGN AFFAIRS TO WORLD WAR I.
Class 3, cr. 3.
An examination of the economic, political and ideological factors which shaped American foreign policy from the colonial era until WW I. Course emphasizes the drive for territorial and commercial expansion which propelled the United States to a position of world power.

HIST 587. UNITED STATES FOREIGN AFFAIRS WORLD WAR I TO PRESENT.
Class 3, cr. 3.
An examination of the economic, political, and ideological factors which shaped American foreign policy from WW I until present. Course emphasizes the intimate relation between domestic conditions and the growing involvement of the United States in world affairs.

HIST 589. HISTORY OF RELIGION IN AMERICA.
Class 3, cr. 3.
A historical examination, from colonial beginnings to the present, of American religions and their role in the social, political, and economic life of the nation.

HIST 590. DIRECTED READING IN HISTORY.
Cr. 1-3.
(May be repeated for credit.)
A reading course directed by the instructor in whose particular field of specialization the content of the reading falls. approval of each reading project must be secured from the department.

HIST 592. EARLY AMERICAN INTELLECTUAL HISTORY.
Class 3, cr. 3.
A survey of American political, economic, philosophical, and religious thought beginning with the European backgrounds of American Puritanism and concluding with the rise of Darwinian naturalism.

HIST 593. TWENTIETH-CENTURY AMERICAN INTELLECTUAL HISTORY.
Class 3, cr. 3.
Origins and developments of modern American thought. Early American religious and philosophical traditions, Darwinian evolution and evolutionary naturalism, pragmatism; and the main currents of the 1920s and 1930s.

HIST 596. THE AMERICAN CITY.
Class 3, cr. 3.
A survey of urban development in the United States from the early Colonial towns to the twentieth-century megalopolis. Emphasis is placed on the city as a particular geographic, economic, political, social, and cultural entity, and on its expanding role in American life.

HIST 601. READING SEMINAR IN EUROPEAN HISTORY.
Cr. 1-3.
Prerequisite: Graduate standing.
(May be repeated for credit.)
Bibliography and historiography of selected fields of topics in European history; may vary in subject matter from semester to semester.

HIST 651. READING SEMINAR IN AMERICAN HISTORY.
Cr. 1-3.
Graduate standing.
(May be repeated for credit.)
Bibliography and historiography of selected fields or topics in American history; may vary in subject matter from semester to semester.

HORTICULTURE

HORT 102. FUNDAMENTALS OF HORTICULTURE
Class 3, cr. 3.
Study of the biology and technology involved in the production, storage, processing and marketing of horticultural plants and products.

HEALTH, PHYSICAL EDUCATION, AND RECREATION

HPER 102. INDIVIDUALIZED PHYSICAL FITNESS.
Class 1, Lab. 2, cr. 1.
Covers various areas of physical fitness which include jogging, weight training, and flexibility exercises. The course will meet three times per week for one hour per day. Students will be expected to devise a realistic physical fitness program for themselves and be evaluated with pre- and post-physical fitness tests. Proper nutrition, rest, exercise, and muscle tone will be covered in the instruction. The course is open to all students. Not applicable to professional education component of HPER K-12.

HPER 217. PHYSICAL EDUCATION PROGRAMS AND ACTIVITIES FOR ELEMENTARY SCHOOL CHILDREN.
Class 1, Lab. 4, cr. 3.
A course covering various aspects of physical education in the elementary school setting. Includes formulating philosophy and objectives, selecting various games and activities, curriculum construction, teaching methods and classroom organization.

HPER 219. ISSUES AND PROBLEMS IN HEALTH.
Class 3, cr. 3.
Designed to acquaint students with various aspects of personal and community health problems. Emphasis will be on current health issues such as pollution, mental health, venereal disease, aging, medical care, etc.

HPER 280. PRINCIPLES OF FIRST AID.
Class 1, Lab. 2, cr. 2.
A course designed to instruct all prospective teachers in the immediate and temporary care given victims of an accident or illness. Covers dressings, bandaging, artificial respiration, lacerations, insect and animal bites and other first aid topics.

HPER 319. PHYSICAL GROWTH OF SCHOOL-AGE CHILDREN.
Class 2, cr. 2.
Designed to acquaint prospective teachers with the physical growth and development of school-age children (K-12) and the implications for school health programs. Includes factors relating to posture, nutrition, allergies, communicable diseases, and special emotional problems.

HPER 590. SPECIAL TOPICS IN PHYSICAL EDUCATION AND RECREATION.
Class 1-3, cr. 1-3.
Admission by consent of instructor.
Topics and credit to be arranged.

HEALTH SCIENCES

HSCI 200. PRECEPTORSHIP IN THE MEDICAL SCIENCES.
Lab. 1, cr. 0.
Prerequisites: Sophomore or higher standing; consent of the preceptorship committee.
The course is designed to provide a pre-professional school experience for students seeking careers in fields such as medicine, dentistry and physical therapy. Individual programs will be designed by the health professions advisor, the student and a practicing health professional. The student will spend two full weeks in a clinical study under the direction of health professionals. Such units as hospital rotations, dental office experience, government health office experience, etc., will be included. A written report of the experience will be made to the advisor and cooperating health professionals.

INTERDISCIPLINARY STUDIES

IDIS 102. HONORS SEMINAR I.
cr. 3
Prerequisite: Admission to the Honors Program.

IDIS 103. HONORS SEMINAR II.
cr. 3
Prerequisite: Admission to the Honors Program
These multidisciplinary courses will familiarize students with issues, subject matter, and methods drawn from science, technology, the humanities and the arts.

INDUSTRIAL ENGINEERING

IE 530. QUALITY CONTROL
Class 3, cr. 3.
Prerequisite: IE 330 or STAT 516 or equivalent.
Principles and practices of statistical quality control in industry. Control charts for measurements and for attributes. Acceptance sampling by attributes and by measurements. Standard sampling plans. Sequential analysis. Sampling inspection of continuous production.

IE 532. RELIABILITY.
Class 3, cr. 3.
Prerequisites: IE 330 and IE 336, or equivalent.
Reliability of components and multicomponent systems. Application of quantitative methods to the design and evaluation of engineering and industrial systems and of processes for assuring reliability of performance. Economic and manufacturing control activities related to product engineering aspects of reliability. Principles of maintainability. Produce failure and legal liability.

IE 535. LINEAR PROGRAMMING.
Class 3, cr. 3.
Prerequisite: IE 335 or equivalent.
Optimization of linear objective functions subject to linear constraints. Development of theory, algorithms, and applications of linear programming.

IE 536. STOCHASTIC MODELS IN OPERATIONS RESEARCH I.
Class 3, cr. 3.
Prerequisite: IE 336 or equivalent.
An introduction to techniques for modeling random processes used in operations research. Markov chains, continuous time Markov processes, Markovian queues, reliability and inventory models.

IE 545. ENGINEERING ECONOMIC ANALYSIS.
Class 3, cr. 3.
Prerequisites: IE 335, or 436, and either 343 or 440, or equivalent.
Analysis of engineering costs and capital investments. Applications of classical optimization, mathematical programming, the theory of the firm, and the theory of production to the analysis of investment proposals. Evaluation and selection of individual projects and formulation of capital investment programs.

IE 546. ECONOMIC DECISIONS IN ENGINEERING.
Class 3, cr. 3.
Prerequisites: IE 336 or IE 501 and either IE 431 or IE 543, or equivalent.
Analytical models and techniques as applied to industrial problems of replacement, production, resource allocation and related problems involving probabilistic behavior. Emphasis is given to model assumptions, implications, input data, and other information at the operating level.

IE 558. SAFETY ENGINEERING.
Class 3, cr. 3.
Prerequisite: IE 386.
Application of human factors and engineering practice in accident prevention and the reduction of health hazards are presented. The objective of this course is to provide an understanding of the safety and health practices which fall within the responsibilities of the engineer in industry. Special attention is devoted to the detection and correction of hazards and to contemporary laws and enforcement on occupational safety and health.

IE 579. ADVANCED PRODUCTION CONTROL.
Class 3, cr. 3.
Prerequisites: IE 483 or 543 or equivalent.
Modern, quantitative, computer-oriented techniques of production planning and control considering deterministic and probabilistic models. Design of industrial production control systems using computer control

IE 590. TOPICS IN INDUSTRIAL ENGINEERING.
Credit and hours to be arranged.
Selected topics in industrial engineering for seniors and graduate students. May be repeated with permission of adviser.

INDUSTRIAL ENGINEERING TECHNOLOGY

IET 104. INDUSTRIAL ORGANIZATION.
Class 3, cr. 3.
A detailed survey of organizational structures; operational, financial, marketing, and accounting activities; duties of management, planning, control, personnel, safety, wages, policy, and human factors necessary for effective management.

IET 120. SYSTEMS AND PROCEDURES.
Class 3, cr. 3.
An introduction to the systems concept. Introduction to surveys recognizing and defining the systems; problems; the management audit and tools for systems analysis. The design and control of forms, work simplification, and organization of the systems functions are included. The use of software packages including work processing, spreadsheets, and databases will be introduced.

IET 204. TECHNIQUES OF MAINTAINING QUALITY.
Class 2, Lab. 2, cr. 3.
Prerequisite: MA 111 and MA 112, or MA 148.
An analysis of the basic principles of quality control. Includes statisti-

cal aspects of tolerances, basic concept of probabilities, frequency distribution, X and R charts and uses of mechanical, electronic, air and light devices for checking and measuring to determine quality levels of acceptance.

IET 224. PRODUCTION PLANNING AND CONTROL.
Class 3, cr. 3.
Preproduction planning of the most economical methods, machines, operations, and materials for the manufacture of a product. The planning, scheduling, routing, and detailed procedure of production control. Includes the use of computers to perform simulations and solve production problems.

IET 264. FUNDAMENTALS OF WORK DESIGN.
Class 2, Lab. 2, cr. 3.
Fundamentals of problem solving applied to methods design. Application of methods tools and work measurement. Includes time study, predetermined time systems, work sampling and computer based standard time data.

IET 272. JOB EVALUATION.
Class 2, cr. 2, or Class 3, cr. 3.
A survey of the basic principles and significance of job evaluation. An analysis of current practices and techniques used i job analysis, job descriptions, and job evaluation.

IET 277. AUTOMATIC IDENTIFICATION.
Class 2, Lab. 2, Cr. 3.
Prerequisite: MET 161 or equivalent.
A course designed to introduce the student to the concepts of Automatic Identification technology and the applications of Automatic Identification systems, with emphasis on Bar coding. The course will review various other methods of keyless data entry, such as Optical Character Recognition (OCR), Magnetic Stripe, Magnetic Ink Character Recognition (MICR), and Radio Frequency (RF). Basic computer systems and the use of database software will also be introduced.

IET 278. APPLIED QUANTITATIVE METHODS.
Class 3, cr. 3.
Prerequisite: MA 148; Corequisite: STAT 301.
Introduction to topics essential to quantitative decision making. Includes basic decision modeling, linear programming, decision tree analysis, queueing theory, and simulation. Emphasis is placed upon appropriate application of techniques using computers.

IET 288. ROBOTIC APPLICATIONS.
Class 3, cr. 3.
A survey of the types and uses of industrial robots currently available. Selection criteria including matching the workplace, safety and maintenance, and economic considerations are discussed. Specific applications will be covered in detail.

IET 299. INDUSTRIAL ENGINEERING TECHNOLOGY.
Class 0-14, Lab. 0-9, cr. 1-9.
Hours and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

IET 310. PLANT LAYOUT AND MATERIAL HANDLING.
Class 3, cr. 3.
Prerequisite: MET 103.
Plant layout involves the design of a production system. The layout must provide for machines, work places, material handling systems, and storage in the capacities necessary so feasible schedules can be met for parts and products; auxiliary services such as offices, shipping and receiving, security, maintenance, etc., must support the firms requirements for safe and efficient production. The design of this system must possess an appropriate degree of flexibility to cope with future design change, new products, volume variations and advancing technology.

IET 314. MANUFACTURING RESOURCES PLANNING.
Class 2, Lab. 2, Cr. 3.
Prerequisite: IET 104, IET 224 or equivalent.
An introduction to Manufacturing Resources planning using a commercial software package. A balanced presentation of the art of coordinating activities at the operational level, understanding and implementation. Emphasis will be placed upon Bill of Materials, Inventory Control, Master Scheduling, Materials Requirements Planning, Purchasing Control and Shop Floor Control.

IET 318. ROBOTIC PROGRAMMING.
Class 2, Lab. 2, cr. 3.
Prerequisite: Any computer programming course.
An introduction to techniques in programming industrial robots. Includes a study of Cartesian coordinate systems using fixed origins and tool mounting origins. Programming robots using both computer consoles (off line) as well as teach pendant (on line). Safety practices and interfacing robots with other equipment will be integrated into lecture and Lab. Laboratory experience includes programming mini-robots and an industrial grade robot.

IET 344. INTRODUCTION TO SIMULATION.
Class 2, Lab. 2, cr. 3.
Prerequisite: MET 161 and Junior standing or consent of the instructor.
An introduction to simulation techniques using a commercial software package. Topics include modeling new or existing manufacturing systems, capacity analysis, inventory control, and modeling for production schedule analysis. Benefits, applications, and drawbacks of simulation and animation will also be studied.

IET 355. STATISTICAL PROCESS CONTROL I.
Class 3, cr. 3.
Prerequisite: STAT 301.
Evaluation, analysis and installation of various procedures that comprise total quality control. Market research, product design, manufacturing planning, purchasing, production, and delivery are covered. Data analysis, quality improvement, quality design and vendor relations are included.

IET 360. INTRODUCTION TO ENERGY MANAGEMENT.
Class 3, cr. 3.
Prerequisite: IET 104 or permission of instructor.
Basic methods used to determine the effective and efficient use of energy to minimize costs. Topics range from global energy availability and trends to specific methods used in energy audits. Also includes impact of energy on process decisions, development of integrated energy systems, elements of design and management of comprehensive energy programs.

IET 365. STATISTICAL PROCESS CONTROL II.
Class 3, cr. 3.
Prerequisite: IET 355.
A continuation of IET 355. Product Control and acceptance techniques, customer relations, and quality assurance are covered.

IET 404. INDUSTRIAL ORGANIZATION.
Class 3, cr. 3.
(Not open to students with credit in IET 104.)
A study of industrial organization structure and an introduction to managerial responsibilities including the activities of industrial administration, managerial controls, manufacturing engineering, material and quality control and labor management. Special emphasis is placed on the interrelationship between these functions. Students will demonstrate the relationship of their discipline of study to the overall organization.

IET 450. PRODUCTION COST ANALYSIS.
Class 3, cr. 3.
(Junior or Senior standing or consent of instructor required.)
An introduction to financial statements and to the study of the costs of production in terms of break-even and least cost alternatives, including present and future costs when related to time value of money, budgeting, labor and overhead, production cost control and the role of the supervisor and the engineering technologist to cost control Computer applications for determining rate of return for complex problems are introduced.

IET 470. FUNDAMENTALS OF PRODUCTION DESIGN.
Class 2, Lab. 2, cr. 3.
Introduction to the basic principles of work methods, work measurement, and human factors as applied to production design.

IET 497. SENIOR PROJECT.
Class 2, Lab. 2, cr. 3.
Hours to be arranged Directed work on individual projects for senior industrial engineering technology students.

MATHEMATICS

MA 091. COOPERATIVE WORK EXPERIENCE 1.
Cr. 0.
Prerequisite: Must be accepted for program by coordinator.
For Cooperative Education Program students only.

MA 092. COOPERATIVE WORK EXPERIENCE 2.
Cr. 0.
Prerequisite: MA 091

MA 093. COOPERATIVE WORK EXPERIENCE 3.
Cr. 0.
Prerequisite: MA 092

MA 094. COOPERATIVE WORK EXPERIENCE 4.
Cr. 0.
Prerequisite: MA 093

MA 095. COOPERATIVE WORK EXPERIENCE 5.
Cr. 0.
Prerequisite: MA 094

MA 010. BASIC ARITHMETIC COMPUTATIONS.
Class 3, Lab. 3, cr. 0.
(8 weeks).
Individualized instruction in topics from arithmetic (whole numbers, fractions, decimals). Tutorial aid is provided.

MA 011. PRE-ALGEBRA PROBLEM SOLVING.
Class 3, Lab. 3, cr. 0.
(8 weeks).
Prerequisite: MA 010 or equivalent, passed.
Individualized instruction in topics preparatory to algebra and geometry. Tutorial aid is provided.

MA 021. BEGINNING ALGEBRA.
Class 3, Lab. 3, cr 0.
Credit: one unit for admission.
Prerequisite: MA 011 or equivalent.

MA 031. GEOMETRY.
Class 3, Lab. 3, cr. 0.
Credit: one unit for admission.
Prerequisite: MA 021 or equivalent.

MA 035. BEGINNING ALGEBRA AND GEOMETRY.
Class 3, Lab. 6, cr. 0.
Prerequisite: MA 011 or equivalent. Not open to students who have credit in MA 031.
This course covers much of the material in MA 021 and MA 031. It is intended primarily for students who have had algebra and geometry before but need a review before proceeding in math.

MA 113. INTERMEDIATE ALGEBRA.
Class 3, cr. 3.
Prerequisite: MA 031 or equivalent.
This course is equivalent to a second year of high school algebra.

MA 121. ELEMENTARY MATHEMATICS.
Class 3, cr. 3.
A survey of mathematics with topics chosen from number theory, topology, set theory, geometry, algebra, and analysis.

MA 122. ELEMENTARY LOGIC AND SET THEORY.
Class 3, cr. 3.
Prerequisite: MA 121 with C or better.
Set operations, power sets, one-to one correspondence, and cardinal numbers; sentential calculus, restricted predicate calculus, negation, and logically valid arguments.

MA 125. BUSINESS MATHEMATICS I.
Class 3, cr. 3.
Prerequisite: MA 113 or equivalent with C or better.
Systems of Linear Equations, Matrices, Vectors, Linear Programming with Business Applications. Exponential and Logarithmic Functions.

MA 126. BUSINESS MATHEMATICS II.
Class 3, cr. 3.
Prerequisite: MA 125 or MA 153 with C or better.
Single-Variable Calculus with Business Applications.

MA 135. MATHEMATICS FOR ELEMENTARY TEACHERS A.
Class 3, cr. 3.
Prerequisite: competency in computational arithmetic. Open only to students in elementary education.
The sequence MA 135-136 fulfills the mathematics requirement for elementary education majors. Numeration systems; natural numbers, whole numbers, numbers of arithmetic, integers, a structural approach.

MA 136. MATHEMATICS FOR ELEMENTARY TEACHERS B.
Class 3, cr. 3.
Prerequisite: MA 135 with C or better. Open only to students majoring in elementary education.
Rationals, reals, a structural approach; metric and non-metric geometry; probability and statistics.

MA 147. ALGEBRA AND TRIGONOMETRY FOR TECHNOLOGY I.
Class 3, cr. 3.
Prerequisite: MA 113 with C or better. Not open to students with credit in MA 151 or 153.
MA 147 and 148 is a two semester sequence in algebra and trigonometry for students in technology. The emphasis is on technique and problem solving. MA 147 concentrates on topics in algebra.

MA 148. ALGEBRA AND TRIGONOMETRY FOR TECHNOLOGY II.
Class 3, cr. 3.
Prerequisite: MA 147 with C or better. Not open to students with credit in MA 151 or MA 154.
Continuation of MA 147. MA 148 concentrates on trigonometry.

MA 150. MATHEMATICS FOR TECHNOLOGY.
Class 5, cr. 5.
Prerequisite: MA 113 or equivalent with C or better.
This course covers the same material as MA 147 and MA 148. Students completing this course will be prepared to take MA 221.

MA 151. ALGEBRA AND TRIGONOMETRY.
Class 5, cr. 5.
High school trigonometry with C or better is recommended.
This course is intended for students who meet the requirements for admission to those departments whose curricula require MA 163 but whose background is insufficient for direct placement into MA 163.

MA 153. ALGEBRA AND TRIGONOMETRY I.
Class 3, cr. 3.
Prerequisite: MA 113 or equivalent with C or better. Not open to students with credit in MA 147, 148, or 151.
The content of MA 153, 154 is similar to that of MA 151 but the pace and emphasis is directed to students who do not intend to take MA 163. All the trigonometry material is contained in MA 154.

MA 154. ALGEBRA AND TRIGONOMETRY II.
Class 3, cr. 3.
Prerequisite: MA 153 with C or better. Not open to students with credit in MA 148 or 151.
Continuation of MA 153.

MA 163. INTEGRATED CALCULUS AND ANALYTIC GEOMETRY I.
Class 5, cr. 5.
Prerequisite: MA 151 or equivalent preparation with C or better.
Topics from plane analytic geometry. Introduction to differentiation and integration. Applications.

MA 164. INTEGRATED CALCULUS AND ANALYTIC GEOMETRY II.
Class 5, cr. 5.
Prerequisite: MA 163 with C or better.
Continuation of MA 163. Completion of introductory study of topics in plane analytic geometry and the calculus of one variable, infinite series.

MA 213. FINITE MATHEMATICS.
Class 3, cr. 3.
Prerequisite: MA 153 or equivalent with C or better.
The topics discussed are: elementary logic and sets, finite probability theory, linear algebra, linear programming, theory of tames. Markov chains, applications to business, behavioral and biological sciences.

MA 214. LINEAR ALGEBRA AND LINEAR PROGRAMMING.
Class 3, cr. 3.
Prerequisite: MA 153 with C or better.
Matrix algebra, systems of equations, linear programming, finite probability, Markov chains. Application to business and management sciences.

MA 221. CALCULUS FOR TECHNOLOGY I.
Class 4, cr. 4.
Prerequisite: MA 148 or equivalent with C or better. Not open to students with credit in MA 163 or 223.
MA 221, 222 is a two semester sequence in the techniques of calculus for students enrolled in certain technical curricula. MA 221 develops topics from analytic geometry, introduces differentiation and integration and their applications.

MA 222. CALCULUS FOR TECHNOLOGY II.
Class 3, cr. 3.
Prerequisite: MA 221 with C or better. Not open to students with credit in MA 224 or MA 164.
Covers differentiation and integration of trigonometric, exponential, and logarithmic functions, infinite series, and first-order differential equations.

MA 223. INTRODUCTORY ANALYSIS I.
Class 3, cr. 3.
Prerequisite: MA 154 or equivalent with C or better. Not open to students with credit in MA 163 or 221.
MA 223 and 224 form a two course sequence and provide an introduction to the differential and integral calculus of one and several variables, and elementary differential equation, with applications to business, behavioral and biological sciences.

MA 224. INTRODUCTORY ANALYSIS II.
Class 3, cr. 3.
Prerequisite: MA 223 with C or better. Not open to students with credit in MA 164 or 222.
Continuation of MA 223.

MA 252. INTRODUCTION TO LINEAR ALGEBRA.
Class 2, cr. 2.
Prerequisite: MA 261 with C or better.
Topics in Linear Algebra. This course is designed for transfer students who already have credit in differential equations.

MA 261. MULTIVARIATE CALCULUS.
Class 4, cr. 4.
Prerequisite: MA 164 with C or better.
Solid analytic geometry, partial differentiation, multiple integrals.

MA 262. LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS.
Class 4, cr. 4.
Prerequisite: MA 261 with C or better.
Linear algebra, elements of differential equations.

MA 321. ADVANCED TECHNOLOGY MATHEMATICS I.
Class 3, cr. 3.
Prerequisite: MA 222 with C or better. Not open to students with credit in MA 261.
Calculus of functions of several variables and other topics in calculus for technology students.

MA 322. ADVANCED TECHNOLOGY MATHEMATICS II.
Class 3, cr. 3.
Prerequisite: MA 222 with C or better. Not open to students with credit in MA 262. MA 321 is not a prerequisite for MA 322.
Matrix algebra, differential equations, Laplace transforms, and Fourier series for technology students.

MA 352. INTERMEDIATE LINEAR ALGEBRA.
Class 3, cr. 3.
Prerequisite: MA 252 or MA 262 with C or better.
Linear Transformations and Matrices, Diagonalization Problems, Canonical Forms, Inner Product Spaces.

MA 362. TOPICS IN ADVANCED CALCULUS.
Class 3, cr. 3.
Prerequisite: MA 262 with C or better.

Multivariate calculus; partial differentiation, implicit function theorems, line and surface integrals, vector fields, theorems of Gauss, Green, and Stokes.

MA 422. DIFFERENTIAL EQUATIONS FOR ENGINEERING AND THE PHYSICAL SCIENCES.
Class 3, cr. 3.
Prerequisite: MA 262 with C or better.
Derivation and solutions of additional types of differential equations for problems in science and engineering.

MA 453. ALGEBRA I.
Class 3, cr. 3.
Prerequisite: MA 262 with C or better.
MA 453 and 454 is a two course sequence for mathematics majors. The topics discussed are: fundamental properties of groups, rings, integral domains, fields; homomorphis; Abelian groups and modules; polynomials, solutions to algebraic equations, field extensions, vector spaces, linear transformations and their decompositions; inner product spaces, characteristic values.

MA 454. ALGEBRA II.
Class 3, cr. 3.
Prerequisite: MA 453 with C or better.
Continuation of MA 453.

MA 462. ELEMENTARY DIFFERENTIAL GEOMETRY.
Class 3, cr. 3.
Prerequisite: MA 262 with C or better.
The geometry of curves and surfaces based on familiar parts of calculus and linear algebra. an introduction to the study of differential manifolds and Riemannian geometry.

MA 480. THE PRACTICUM IN APPLIED MATHEMATICS.
Class 3, cr. 3.
(Same as CS 480.)
The practicum course consists of a small team (a faculty advisor and 1-4 students) working on a real problem obtained in conjunction with a local business or industry. Not more than two terms of MA 480 and/or CS 480 may be taken for credit.

MA 490. TOPICS IN MATHEMATICS FOR UNDERGRADUATES.
Cr. 1-5.
Supervised reading and reports in various fields. Open only to students with the consent of the department.

MA 510. VECTOR CALCULUS.
Class 3, cr. 3.
Prerequisite: MA 262 with C or better. Not open to students with credit in MA 362.
Functions of several variables: partial derivative, differential; quadratic approximation, extrema; vector calculus, gradient; line, surface and volume integrals; divergence, curl, Laplacian, integral theorems; mappings, continuity, differentiability, inverse mapping; implicit functions; orthogonal coordinates.

MA 520. BOUNDARY VALUE PROBLEMS OF DIFFERENTIAL EQUATIONS.
Class 3, cr. 3.
Prerequisite: MA 362 or MA 510 and MA 422 with C or better.
Fourier Series, Sturm-Liousville theory; orthogonal expansions, separation of variables in partial differential equations; spherical harmonics.

MA 521. INTRODUCTION TO OPTIMIZATION PROBLEMS.
Class 3, cr. 3.
Prerequisite: MA 362 or MA 510, and MA 262 with C or better.
Linear programming, simplex algorithm, calculus of variations, necessary and sufficient conditions of extrema.

MA 523. INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS.
Class 3, cr. 3.
Prerequisite: MA 422 and MA 362 or MA 510 with C or better.
First order quasilinear equations and their application to physical and social sciences, characteristics, classification and canonical form of linear equations.

MA 525. INTRODUCTION TO COMPLEX ANALYSIS.
Class 3, cr. 3.
Prerequisite: MA 362 or MA 510 with C or better.
Complex numbers and complex-valued functions; differentiation of complex functions; power series, uniform convergence; integration, contour integrals; elementary conformal mapping.

MA 534. ADVANCED ANALYSIS FOR ENGINEERS AND SCIENTISTS.
Class 3, cr. 3.
Prerequisite: MA 352, and MA 362 or MA 510 with C or better.
An introduction to nomed linear spaces; Hilbert spaces; linear operations; spectral theory; selected applications.

MA 540. ANALYSIS I.
Class 3, cr. 3.
Prerequisite: MA 362 with C or better.
Real number system, basic topology, infinite series, continuity, differentiation, integration.

MA 541. ANALYSIS II.
Class 3, cr. 3.
Prerequisite: MA 540 with C or better.
Sequences and series of functions, uniform convergence, equicontinuous families, the Stone-Weierstrass Theorem, Fourier series, introduction to Labesgue measure and integration.

MA 547. ANALYSIS FOR TEACHERS I.
Class 3, cr. 3.
Prerequisite: MA 261 with C or better.
Inequalities, sequences, functions, limits. Application to such basic concepts as length and area and their implications for the teacher of mathematics.

MA 548. ANALYSIS FOR TEACHERS II.
Class 3, cr. 3.
Prerequisite: MA 547 with C or better.
Continuation of MA 547.

MA 550. ALGEBRA FOR TEACHERS I.
Class 3, cr. 3.
Prerequisite: MA 262 with C or better or graduate standing.
May not be used for a major in mathematics.
Definitions and elementary properties of groups, rings, integral domains, field, vector spaces, and matrices with major emphasis on the rings of integers, rational numbers, complex numbers and polynomials. Intended primarily for secondary school teachers.

MA 551. ALGEBRA FOR TEACHERS II.
Class 3, cr. 3.
Prerequisite: MA 550 with C or better.
A continuation of MA 550.

MA 553. INTRODUCTION TO ABSTRACT ALGEBRA.
Class 3, cr. 3.
Prerequisite: MA 453 with C or better.
Basic properties of groups, rings, integral domains, fields, polynomials Solvable groups. Finitely generated abelian groups. Algebraic and transcendental field extensions. Separable extensions. Normal extension, galois theory.

MA 554. LINEAR ALGEBRA.
Class 3, cr. 3.
Prerequisite: MA 352 with C or better.
Vector spaces, linear transformations, matrices. Solution of systems of linear equations. Determinant. Inner product spaces; orthogonal reduction of symmetric matrices. Direct sum decompositions, characteristic values, diagonable and nilpotent transformations, Jordan normal form.

MA 556. INTRODUCTION TO THE THEORY OF NUMBERS.
Class 3, cr. 3.
Prerequisite: MA 261 with C or better.
Divisibility, congruences, quadratic residues, diophantine equations, the sequence of primes.

MA 560. FUNDAMENTAL CONCEPTS OF GEOMETRY.
Class 3, cr. 3.
Prerequisite: MA 261 with C or better.
Foundations of Euclidean geometry, including Euclid's "elements" and detailed study of an axiom system such as that of Hilbert. Independence of the parallel axiom and introduction to non-Euclidean geometry.

MA 561. PROJECTIVE GEOMETRY.
Class 3, cr. 3.
Prerequisite: MA 261 with C or better.
Ideal elements, duality, harmonic sets, projective metric; theory of conics, involution, imaginary elements.

MA 563. ADVANCED GEOMETRY.
Class 3, cr. 3.
May not be used for a major in mathematics.
A critique of Euclid's elements and a detailed study of Hilbert's postulates with an introduction to non-Euclidean geometry. Primarily for prospective secondary school teachers.

MA 571. ELEMENTARY TOPOLOGY.
Class 3, cr. 3.
Prerequisite: MA 362 or MA 510 with C or better.
General topological spaces and continuity. Connectedness. Separation. Compactness. Metric spaces. Function spaces.

MA 581. INTRODUCTION TO LOGIC FOR TEACHERS.
Class 3, cr. 3.
Prerequisite: MA 262 with C or better.
Sentential and general theory of inference and nature of proof; elementary axiom systems.

MA 583. HISTORY OF ELEMENTARY MATHEMATICS.
Class 3, cr. 3.
A survey of elementary mathematics before the calculus. An effort will be made to link the history of mathematics to that of other sciences and to the social history of the relevant periods. Some acquaintance with ancient history of Europe is desirable.

MA 587. GENERAL SET THEORY.
Class 3, cr. 3.
Prerequisite: MA 453 or MA 550 with C or better.
Set algebra. Functions and relations. Ordering relations. Transfinite induction. Cardinal and ordinal numbers. The axiom of choice. Maximal principles. The continuum hypothesis. Application to algebra, analysis and topology.

MA 598. TOPICS IN MATHEMATICS.
Cr. 1-5.
Directed study and reports for students who wish to undertake individual reading and study on approved topics.

MECHANICAL ENGINEERING

ME 271. BASIC MECHANICS I (STATICS).
Class 3, cr. 3.
Corequisite: MA 261.
Prerequisites: MA 163, MA 164, and PHYS 152 with a minimum grade of C.
Review of vector algebra and equilibrium. Hydrostatics, virtual work, static stability, friction. First and second moments of areas, volumes, and masses, center of gravity.

ME 275. BASIC MECHANICS II (DYNAMICS).
Class 3, cr. 3.
Prerequisites: MA 261, ME 271.
Fundamental concepts, kinematics, translation and rotation. Kinetics impulse, momentum, work, energy. Rectilinear and curvilinear translation of point masses. Plane motion of rigid bodies and vibration.

ME 291. INDUSTRIAL PRACTICE I.
Cr. 0.
For co-operative engineering students only.
Prerequisite: must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

ME 292. INDUSTRIAL PRACTICE II.
Cr. 0.
For co-operative engineering students only.
Prerequisite: must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

ME 305. GENERAL THERMODYNAMICS I.
Class 3, cr. 3.
Prerequisite: MA 261.
Properties of pure substances, work and heat, first and second laws of thermodynamics, entropy, irreversibility and availability, power and refrigeration cycles, thermodynamic relations.

ME 306. GENERAL THERMODYNAMICS II.
Class 3, cr. 3.
Prerequisite: ME 305.
Thermodynamic relations. Power and refrigeration cycles, methods of thermodynamic analysis, technical thermodynamics and design, energy conversion. Thermodynamics of combustion processes and equilibrium.

ME 312. FLUID MECHANICS.
Class 3, cr. 3.
Prerequisites: MA 262, ME 275.
Corequisites: ME 305, ME 313.
Continuum, velocity field, fluid statics, basic conservation laws for systems and control volumes, dimensional analysis, Euler and Bernoulli equations, viscous flows, boundary layer flow in channels and around submerged bodies, one-dimensional gas dynamics.

ME 313. FLUID MECHANICS LABORATORY.
Lab. 3, cr. 1.
Corequisite: ME 312.
Introduction to fluid mechanics laboratory, experiments on flow patterns, velocity profile in an air

pipe, wind tunnel calibration, draining of a tank, pipe friction, boundary layer studies, falling ball experiments, and viscosity measurements.

ME 320. KINEMATIC ANALYSIS AND DESIGN.
Class 2, Lab. 3, Cr. 3.
Prerequisite: ME 275.
Graphical, analytical, and computer techniques for analyzing displacements, velocities, and accelerations in mechanisms. Analysis and design of linkages, cams, and gears. Laboratory projects include analysis, design, construction, and evaluation of mechanisms.

ME 345. MECHANICAL ENGINEERING EXPERIMENTATION.
Class 2, Lab. 3, cr. 3.
Prerequisites: CE 273, ENGR 325.
Mechanical measurements and methods of experimentation. Calibration standards, statistical replication and error minimization, transducers and instrumentation, dimensional analysis and the design of an experiment. Laboratory experiments will require formal reports and will deal with displacements, velocities, pressures, and elastics strains.

ME 393. INDUSTRIAL PRACTICE III.
Cr. 0.
For co-operative engineering students only.
Prerequisite: must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

ME 394. INDUSTRIAL PRACTICE IV.
Cr. 0.
For co-operative engineering students only.
Prerequisite: must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

ME 395. INDUSTRIAL PRACTICE V.
Cr. 0.
For co-operative engineering students only.
Prerequisite: must be accepted for the co-op program by the co-operative engineering representative.
Practice in industry and comprehensive written report of this practice.

ME 416. HEAT TRANSMISSION.
Class 3, cr. 3.
Prerequisites: ME 305, ME 312, ME 313.
Corequisite: ME 417.
Steady state and transient heat transfer by conduction, laminar and turbulent convection, film condensation and boiling, and by radiation. Combined heat and mass transfer by diffusion and convection. The analysis and design of heat exchangers for process heat transfer.

ME 417. HEAT TRANSMISSION LABORATORY.
Lab. 3, cr. 1.
Corequisite: ME 416.
Heat transmission laboratory with measurements of temperatures and flows. Experiments include temperature profiles in solids, thermal conductivity, radiation, and the determination of various heat and mass transfer coefficients.

ME 418. HEATING AND AIR CONDITIONING ANALYSIS & DESIGN.
Class 3, cr. 3.
Prerequisite: ME 416.
Psychometrics, air conditioning systems, equipment selection, duct design and piping design. Heating and cooling loads, solar radiation and heat transmission in buildings. Heat pumps. Application of air conditioning to residences, computer rooms, light commercial and high-rise buildings.

ME 461. MECHANICAL ENGINEERING DESIGN.
Class 3, Lab. 3, cr. 4.
Prerequisites: CE 273, ME 320.
Application of mechanics and mechanics of materials in design. Solution of design problems using finite element analysis. Design of engineering parts considering fatigue and mechanical behavior. Selection and sizing of basic mechanical components. Laboratory includes solution of design problems.

ME 497. SELECTED TOPICS IN MECHANICAL ENGINEERING.
Cr. 1-6.
May be repeated for credit.
Available upon arrangement with the head of the department.

ME 500. THERMODYNAMICS.
Class 3, cr. 3.
Prerequisite: ME 306.
The empirical, physical basis of the laws of thermodynamics. Availability concepts and applications. Properties and relations between properties in homogeneous and heterogeneous systems. The criteria of equilibrium. Application to a variety of systems and problems including phase and reaction equilibrium.

ME 505. HEAT AND MASS TRANSFER.
Class 3, cr. 3.
Prerequisite: ME 416.
Heat and mass transfer by diffusion in one-dimensional, two-dimensional, transient, periodic, and phase change systems. Convective heat transfer for external and internal flows. Similarity and integral solution methods. Heat, mass, and momentum analogies. Turbulence. Buoyancy driven flows. Convection with phase change. Radiation exchange between surfaces and radiation transfer in absorbing-emitting media. Multimode heat transfer problems.

ME 509. INTERMEDIATE FLUID MECHANICS.
Class 3, cr. 3.
Prerequisite: ME 312.
Fluid properties. Basic laws for a control volume. Kinematics of fluid flow. Dynamics of frictionless incompressible flow and basic hydrodynamics. Equations of motion for viscous flow, viscous flow applications, boundary layer theory. Wall turbulence, lift and drag of immersed bodies.

ME 510. GAS DYNAMICS.
Class 3, cr. 3.
Prerequisite: ME 312.
Flow of compressible fluids. One-dimensional flows including basic concepts, isentropic flow, normal and oblique shock waves, Rayleigh line, Fanno line, and simple waves. Multidimensional flows including general concepts, small perturbation theory for linearized flows and method of characteristics for nonlinear flows.

ME 527. SOLAR ENERGY SYSTEMS.
Class 3, cr. 3.
Prerequisite: Undergraduate course in heat transfer.
Fundamentals. Availability of solar energy. Spectral distribution of solar radiation. Thermal analysis of solar collectors. Thermal energy storage. Solar ponds. Concepts of solar-thermal energy systems. Heating and cooling: energy transport in solar systems. Controls for solar-thermal systems. Mathematical models of solar systems. Solar water heating. Liquid-based solar heating systems in buildings. Solar air heating systems. Solar heating economics. Solar space cooling. Advanced concepts and applica-

tions: solar desalination, stills, dehumidification. Solar thermal power systems. Collectors for high temperatures. Solar heat engines, solar-assisted heat pumps. Solar water pumps. Photovoltaic electric generation. Biological conversion systems. Photochemical systems.

ME 530. DIRECT ENERGY CONVERSION.
Class 3, cr. 3.
Prerequisite: a first course in thermodynamics plus topics in elementary fluid mechanics and elementary electromagnetics.
Energy sources; basic science of energy conversion; thermoelectric, thermionic, and magnetohydrodynamic systems; photo voltaic effects; solar cells and fuel cells.

ME 560. KINEMATICS.
Class 3, cr. 3.
Prerequisite: ME 320.
Geometry of constrained plane motion with applications to linkage design. Type and number synthesis. Path curvature, inflection circle, cubic of stationary curvature. Finite displacements, three and four separated positions. Graphical, analytical, and computer techniques.

ME 563. MECHANICAL VIBRATIONS.
Class 3, cr. 3.
Prerequisites: CE 273 and ENGR 325.
Review of systems with one degree of freedom. LaGrange's equations of motion for multiple degree of freedom systems. Introduction to matrix methods. Transfer functions for harmonic response, impulse response, and step response. Convolution integrals for response to arbitrary inputs. Principle frequencies and modes. Applications to critical speeds, measuring instruments, isolation, torsional systems. Introduction to nonlinear problems.

ME 580. NONLINEAR ENGINEERING SYSTEMS.
Class 3, cr. 3.
Prerequisite: ME 563 or consent of instructor.
Methods of analysis for nonlinear ordinary differential equations arising in engineering systems. Review of linear systems. Stability concepts. Phase plane methods. Perturbation and averaging methods of analysis. Self-excited and parametrically-excited systems. Relaxation oscillations. Systems with more than one degree of freedom.

ME 597. SELECTED TOPICS IN MECHANICAL ENGINEERING.
Cr. 1-6.
(May be repeated for credit.)
Available by arrangement with individual faculty members.

ME 698. RESEARCH.
M.S. Thesis.

MECHANICAL ENGINEERING TECHNOLOGY

MET 103. PRODUCTION DRAWING & COMPUTER AIDED DRAFTING I.
Class 1, Lab. 5, cr. 3.
A basic mechanical drawing course including about 60% manual drafting and 40% hands-on experience in Computer Aided Drafting. The manual drafting covers such basic graphic topics as: multi-view and isometric drawings; geometric constructions; sectional views; dimensioning; and auxiliary views. In addition there are some machine drawing blueprint reading exercises, along with related mechanical concepts and terminology. The Computer Aided Drafting (CAD) includes a significant amount of hands-on experience on a CAD system doing follow-up activities on things worked on previously in the manual drafting portion of the course

MET 118. APPLIED MECHANICS: STATICS.
Class 3, cr. 3.
Prerequisite: MA 147, PHYS 218.
A study of force systems, resultants and equilibrium, centroids of areas and centers of gravity of bodies, trusses, frames, beams, friction and moments of inertia or areas and bodies.

MET 161. INTRODUCTION TO COMPUTERS AND COMPUTER AIDED DESIGN.
Class 2, Lab. 2, cr. 3.
Prerequisites or corequisites: MA 147, MET 103.
Solving typical design and analysis problems through the use of computers. Preparation of technical graphs and reports of computations. Computer-aided drafting and design fundamentals will be introduced.

MET 205. PRODUCTION DRAWING & COMPUTER AIDED DRAFTING II.
Class 2, Lab. 2, or Class 1, Lab. 5, cr. 3.
Prerequisites: MFET 135, MET 161, MET 103.
Application of principles of engineering drawing to layout, assembly, and detail drawing. Introduction to geometric dimensioning and tolerancing and computer-aided design and manufacturing documentation techniques.

MET 211. APPLIED STRENGTH OF MATERIALS.
Class 3, cr. 3.
Prerequisites: MET 118 and MET 161.
Principles of applied strength of materials primarily with reference to mechanical design. Includes the use of computers to perform simulations and solve design problems.

MET 214. MACHINE ELEMENTS.
Class 3, cr. 3.
Prerequisites: MET 211, MET 218, and MET 161.
The theories and methods developed in statics, dynamics, and strength of materials are applied to the selection of basic machine components. The course will develop the fundamental principles required for the selection of the individual elements of which a machine is composed.

MET 218. APPLIED MECHANICS: DYNAMICS.
Class 3, cr. 3.
Prerequisites: MET 118 and MET 161.
The study of applied fundamentals of dynamic forces, including displacement, velocities, accelerations, work energy, power, impulse, momentum and impact. Includes the use of computers to perform simulations and solve design problems.

MET 230. FLUID POWER.
Class 2, Lab. 2, cr. 2.
Prerequisite: PHYS 218.
A study of compressible and incompressible fluid statics and dynamics as applied to industrial hydraulic and pneumatic circuits and controls.

MET 266. STRENGTH OF MATERIALS/TESTING LABORATORY.
Class 2, Lab. 3, cr. 3.
Prerequisite: MET 211.
Extensive testing of mechanical engineering materials to determine

physical and mechanical properties. Preparation of reports from data secured from laboratory testing will be required.

MET 299. MECHANICAL ENGINEERING TECHNOLOGY.
Cr. 1-9.
Hours and subject matter to be arranged by staff. Primarily for third or fourth semester students with special aptitudes.

MET 313. APPLIED FLUID MECHANICS.
Class 3, cr. 3.
Prerequisites: MET 325 or MET 425.
The fundamentals of fluid mechanics, including properties of fluid, pressure, hydrostatics, and dynamics of fluid flow; friction losses and sizing of pipes.

MET 314. FUNDAMENTALS OF MACHINE ELEMENTS II.
Class 3, cr. 3., or Class 2, Lab. 2, cr. 3.
Prerequisite: MET 214.
A second course in machine elements. Topics covered include roller bearings, helical gears, worm gears, bevel gears, long shoe brakes, power screws, curved beams, thick and thin walled cylinders, chain drives, and additional topics. Also some consideration of theories of failure, stress concentration, and endurance limit. Includes lab experience in design applications.

MET 315. APPLIED MECHANISM KINEMATICS.
Class 3, cr. 3., or Class 2, Lab. 2, cr. 3.
Prerequisites: MET 218 and MET 214.
Application of the principles of kinematics to mechanisms. Graphical and semi-graphical methods are used to determine displacements, velocities and accelerations in common mechanisms. Practical coverage of slider-crank mechanisms, scotch yoke, four bar linkage, Witworth mechanism, universal joints, Geneva wheel, and cams.

MET 316. APPLIED DYNAMICS OF MACHINES.
Class 2, Lab. 2, cr. 3. or Class 3, cr. 3.
Prerequisites: MET 218, MET 315.
Application of the principles of dynamics and vibrations to mechanisms and machines. Force analysis of machines, balancing of rotating mass systems, elementary vibrations, and critical speed of shafts.

MET 325. APPLIED THERMODYNAMICS I.
Class 3, cr. 3.
Prerequisites: MA 221, PHYS 218.
Applications of perfect gas laws, steam tables, principles of conservation of mass and energy, and heat transfer as they apply to power plants, engines, pumps, fans and refrigeration systems.

MET 326. PRINCIPLES OF AIR CONDITIONING.
Class 3, cr. 3.
Prerequisite: MET 325 or 425.
A study of heat losses, heat producing equipment and cooling equipment, in addition to the design of the direct systems. Includes controls and cost estimating for commercial industrial and residential systems. Codes and standard are emphasized throughout the course. The use of computer programming to analyze cooling loads and heat gains.

MET 327. PRINCIPLES OF REFRIGERATION.
Class 3, cr. 3.
Prerequisite: MET 325 or 425.
Product and space cooling requirements, compressors, evaporators, condensers, and controls for small and large applications, selection of equipment to meet design criteria.

MET 329. APPLIED HEAT TRANSFER.
Class 3, Lab. 0, cr. 3.
Prerequisites: MET 325 and/or PHYS 218.
An applied approach to the introduction of basic vocabulary and concepts related to the steady state transfer of thermal energy. The three basic modes of heat transfer (i.e., conduction, convection, radiation) will be covered. Additional topics will include heat exchangers, boilers and solar energy.

MET 340. PIPING AND PLUMBING DESIGN.
Class 3, cr. 3.
Prerequisites: MET 230 and MET 211.
Design of plumbing systems, includes losses in pipes, fittings, nozzles, orifices, etc. Includes steam, water, and oil systems. Piping handbooks and catalogs are utilized in conjunction with the State of Indiana Piping Code.

MET 380. MATERIALS AND PROCESSES.
Class 2, cr. 2.
Not available to MET or MFET students.
Application and characteristics, both physical and chemical, or the materials most commonly used in industry; the primary processes involved in producing these materials for industry.

MET 384. INSTRUMENTATION.
Class 2, Lab. 3, cr. 3.
Prerequisite: MA 148 or permission of instructor.
Study of measurement theory and principles, including temperature, pressure, level, flow and similar measurement used to control manufacturing processes.

MET 412. MECHANICS OF MATERIALS.
Class 4, cr. 4.
Prerequisite: MA 148.
Not available to MET or MFET students.
Forces acting on rigid bodies at rest and in motion-embracing vectors, force and moment laws of equilibrium for various force systems, centroids, center of gravity and moments of inertia, stress and strain, riveted and welded joints, torsion, shear, bending and deflection of beams, combined stresses and columns.

MET 425. APPLIED THERMODYNAMICS II.
Class 3, cr. 3.
Prerequisites: MA 221 and MET 325.
the applications of thermodynamics including the first and second laws, entropy and reversibility to common mechanical systems. Nonideal gas assumptions including gas tables and variable specific heats are covered.

MET 426. INTERNAL COMBUSTION ENGINES.
Class 2, Lab. 2, cr. 3.
Prerequisite: MET 325.
A study of the spark ignition, compression ignition, and continuous burning internal combustion engines.

MET 485. CONTROL SYSTEMS COMPONENTS.
Class 2, Lab. 3, cr. 3.
MET 384 or permission of the instruction.
Process control components, process characteristics, control modes, and control system analysis.

MET 495. SENIOR PROJECT SURVEY.
Class 1, cr. 1.
Prerequisite: Completion of junior year requirements in MET.
Students will select several design projects and give written or oral reports on their proposed solutions. They will be encouraged to select and finalize one project proposal in preparation for MET 497.

MET 497. SENIOR PROJECT.
Class 2, Lab. 2, cr. 3.
Prerequisite: MET 495.
Directed work on individual projects for senior mechanical engineering technology students.

MET 499. MECHANICAL ENGINEERING TECHNOLOGY.
Class 0-4, Lab. 0-9, cr. 1-9.
Hours and subject matter to be arranged by staff. Course may be repeated for credit.

MANUFACTURING ENGINEERING TECHNOLOGY

MFET 105. INTRODUCTION TO MANUFACTURING.
Class 1, Lab. 2, cr. 2.
A survey of the manufacturing field as it relates to the academic background and opportunities for manufacturing engineering technology graduates. Lectures, demonstrations and laboratory work introduce the students to the program.

MFET 135. MANUFACTURING PROCESSES I.
Class 2, Lab. 2, cr. 3.
Prerequisite: MA 147 and MET 103.
Introduction to the principles, techniques, and applications of chip generating processes. Laboratory experience includes machine tool setup and operation, measurement techniques, and safety aspects.

MFET 180. MANUFACTURING MATERIALS I.
Class 3, Lab. 0, cr. 3.
Pre or corequisites: CHM 111 or consent of the instructor.
An introduction to the applications and selection of materials used in all types of manufactured products. Topics include material structure, properties, treatment, and manufacturing processes. Laboratory experiences will be covered in MET 266, Material Science and Testing Laboratory.

MFET 235. MANUFACTURING PROCESSES II.
Class 2, Lab. 2, cr. 3.
Prerequisite: MFET 135.
This course presents a survey of the major chipless forming processes: casting; hot and cold working; press work; powder metallurgy; welding; non-traditional forming processes; and plastics processing technology.

MFET 275. NUMERICAL CONTROL APPLICATIONS.
Class 2, Lab. 2, cr. 3.
Prerequisite: MA 148, MFET 135, MET 103.
A study of the principles, techniques and applications of numerically controlled machine tools. Applications of specific languages involving lab. experiences with NC equipment and tape preparation devices.

MFET 280. MANUFACTURING TOOL DESIGN.
Class 2, Lab. 2, cr. 3.
Prerequisite: MET 205, MET 211, MFET 135.
Classroom discussions and actual design projects are combined to gain knowledge and experience necessary to design tools commonly used in modern manufacturing processes. Course consists of designing tools, gages, simple jigs, fixtures, punches and dies as employed in mass production processes.

MFET 299. MANUFACTURING ENGINEERING TECHNOLOGY.
Cr. 1-9.
Hours and subject matter to be arranged by staff. Primarily for third and fourth semester students with special aptitude.

MFET 355. AUTOMATION I.
Class 2, Lab. 2, cr. 3.
Prerequisite: Sophomore standing or equivalent.
An introduction to the design and applications of programmable controller systems. Topics include programming techniques, input/output devices, personal computer interface, system design, safety and applications for automation.

MFET 380. MANUFACTURING MATERIALS II.
Class 2, Lab. 2, cr. 3.
Prerequisite: MFET 180, MET 266.
This course is part of a two-course sequence for students majoring in MET or MFET. The emphasis in the course is on both classroom and laboratory work dealing with: non-ferrous metals; plastics; ceramics; and composite materials.

MFET 461. COMPUTER-AIDED MANUFACTURING.
Class 2, Lab. 2, Cr. 3.
Prerequisites: MET 103 and MFET 275, or equivalent.
Advanced study of computer-aided design and manufacturing with emphasis on computer-aided manufacturing. This course will cover the study of various CAD/CAM systems, creating piece part geometry using a CAD system, generating tool path simulation, and machining the part on a CNC machine. Students will also be introduced to writing post processor for different machines and a detailed study of various tools and fixtures used in the industry.

MFET 465. COMPUTER-AIDED DESIGN WITH APPLICATIONS.
Class 2, Lab. 2, cr. 3.
Prerequisites: MET 103, MET 161, and MFET 135 equivalent.
This course provides an advanced study of computer-aided drafting and design utilizing current computer-aided industrial systems. The course also introduces the use of these systems in design and manufacturing applications such as the generation of computer-numerically controlled tool paths directly from CAD drawings and finite element analysis.

MFET 475. ADVANCED NUMERICAL CONTROL.
Class 2, Lab. 2, cr. 3. or Class 3, cr. 3.
Prerequisite: MFET 275.
A continuation of MFET 275, which introduces the student to advanced computer-assisted programming languages such as APT. Emphasis will be on contouring techniques along with some discussion of equipment evaluation and justification.

MFET 490. MANUFACTURING LABORATORY.
Class 1, Lab. 4, cr. 3.
Prerequisite: Senior standing.
This course is intended as a capstone to the manufacturing engineering technology program. The focus is to have the student consolidate previously acquired information and knowledge in a final project.

MFET 499. MANUFACTURING ENGINEERING TECHNOLOGY.
Class 0-4, Lab. 0-9, cr. 1-9.
Hours and subject matter to be arranged by staff. Course may be repeated for credit.

MANAGEMENT

MGMT 101. INTRODUCTION TO BUSINESS.
Class 3, cr. 3.
An introduction to the internal operations and external environment of contemporary business. Consideration is also given to the social and economic role of business in our society. The basic business functions and role of management are also discussed.

MGMT 200. INTRODUCTORY ACCOUNTING.
Class 3, cr. 3. or Class 3, Lab. 2, cr. 2.
Prerequisite: sophomore standing.
An examination of the system by which accounting data is gathered from economic events. Construction and uses of financial statements.

MGMT 201. MANAGERIAL ACCOUNTING.
Class 3, cr. 3.
Prerequisite: MGMT 200 or equivalent.
An introduction to internal uses of account information. Consideration of budgeting and various inventory costing methods.

MGMT 225. FUNDAMENTAL MANAGERIAL STATISTICS.
Class 3, cr. 3.
Prerequisite: MA 126 or equivalent..
The foundation for statistical decision making. Topics include: probability theory, descriptive statistics, estimation, and hypothesis testing with managerial applications.

MGMT 240. PERSONAL FINANCIAL MANAGEMENT.
Class 3, cr. 3.
(Credit will only be given for one of the following: ECON 240, MGMT 240 or MGMT 442.)
Lectures and case analysis of managing one's personal finances; includes budgeting, credit analysis, insurance, taxation, housing, estate planning, private and business investment. Not available for credit in Management concentrations.

MGMT 305. BUSINESS STATISTICS.
Class 3, cr. 3.
Prerequisite: MGMT 225.
An introduction to quantitative decision procedures under uncertainty and the foundations of probability theory and statistical decision theory.

MGMT 306. MANAGEMENT SCIENCE.
Class 3, cr. 3.
Prerequisite: MGMT 225.
An introduction to quantitative decision procedures under uncertainty and mathematical model building. Linear programming and other topics in operations research.

MGMT 310. FINANCIAL MANAGEMENT.
Class 3, cr. 3.
Prerequisite: MGMT 200.
Management of the financial affairs of the industrial enterprise. Treats short-term cash budgeting, asset management, capital budgeting, capital structure decisions, and dividend policy.

MGMT 324. MARKETING MANAGEMENT.
Class 3, cr. 3.
Prerequisite: MGMT 200 or ECON 251 or departmental permission.
A managerial approach to the job of learning to make a decision on product policy, distribution channels, pricing, personal selling, advertising, and marketing research.

MGMT 340. CORPORATE FINANCIAL PROBLEMS.
Class 3, cr. 3.
Prerequisite: MGMT 225 and MGMT 310.
Advanced topics in financial management of corporations, from the viewpoint of an internal financial officer. A continuation of MGMT 310 with additional depth and topic coverage emphasizing applications.

MGMT 350. INTERMEDIATE ACCOUNTING I.
Class 3, cr. 3.
Prerequisite: MGMT 201 or equivalent.
Financial reporting for interested external parties. Emphasis on asset valuation, income measurement, and preparation of financial statements.

MGMT 351. INTERMEDIATE ACCOUNTING II.
Class 3, cr. 3.
Prerequisite: MGMT 350.
Continuation of Intermediate Accounting I, MGMT 350. Introduction of more advanced problems in financial reporting in the areas of pensions, leases, price-level statements and foreign currency transactions.

MGMT 354. LEGAL FOUNDATIONS OF BUSINESS I.
Class 3, cr. 3.
Nature and place of law in our society, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency.

MGMT 360. PRODUCTION/OPERATIONS MANAGEMENT.
Class 3, cr. 3.
Prerequisite: MGMT 225.
An introductory course concerning the management of production, distribution and service system operations. Topics covered include design of products, processes and facilities, planning, scheduling, and controlling inventory and quality.

MGMT 412. MONEY AND CAPITAL MARKETS.
Class 3, cr. 3.
Prerequisite: MGMT 310 and ECON 252.
General subject matter in the financial behavior of households, corporations, the federal government, and financial institutions such as commercial banks, savings and loan associations, life insurance companies, and finance companies. Emphasis is on interaction of these sectors in the determination of various interest rates in recent years.

MGMT 425. MARKETING PLANNING AND RESEARCH.
Class 3, cr. 3.
Prerequisite: MGMT 324 and MGMT 225.
The management of the marketing research function in industrial firms. Emphasis on market research and information systems for planning and control.

MGMT 426. RETAILING.
Class 3, cr. 3.
Prerequisite: MGMT 324 or departmental permission.
Functions of a retail establishment are examined. The topics covered include retail operations planning; buyer behavior, store design, location, and layout; organizing and staffing the retail firm; merchandise management; pricing concepts and strategies; promotion; credit; financial management; and a discussion of the future of retailing. Emphasis is given to significant developments taking place in the major environments of retailing to include social,

economic, technological, and legal aspects.

MGMT 427. SALES MANAGEMENT.
Class 3, cr. 3.
Prerequisite: MGMT 324.
Organization, management, and operation of the sales force. Examines the recruitment, selection, and processing of the sales force; training programs; compensation of the sales force; motivation; forecasting; sales department budgeting, and performance evaluation. Emphasis is given to the management of an outside sales force and its activities.

MGMT 428. ADVERTISING MANAGEMENT.
Class 3, cr. 3.
Prerequisite: MGMT 324.
Provides an understanding and evaluation of the advertising function within the modern business environment. Covers history; advertising and the promotional mix; the advertising agency; budget determination; advertising media including: print, broadcast, outdoor, and nonmedia; and creative aspects of advertising. Management decision making is stressed in advertising as a vital communication tool.

MGMT 440. MANAGEMENT OF FINANCIAL INSTITUTIONS.
Class 3, cr. 3.
Prerequisite: MGMT 310.
Management and policy topics providing insight on the internal operating procedures and problems of financial institutions. Principles of loan analysis and the role of financial institutions in the capital markets are studied with an emphasis on commercial bank management.

MGMT 442. PERSONAL FINANCE.
Class 3, cr. 3.
(Credit will only be given for one of the following: ECON 240, MGMT 240, or MGMT 442.)
Lectures and discussion on problems of managing one's personal finances. Covers budgeting; use of and cost of credit; life and property insurance; income and estate taxation; housing; wills, trusts and estate planning; saving and investments. Not available for credit towards economics and business economics concentrations.

MGMT 443. FUNDAMENTALS OF INVESTMENTS.
Class 3, cr. 3.
Prerequisite: MGMT 310
Operations of the markets in which securities are traded and investment alternatives are studied. Theory and application of security valuation and portfolio selection techniques are examined with emphasis upon evaluation of investment performance.

MGMT 450. BUSINESS POLICY.
Class 3, cr. 3.
Prerequisite: MGMT 310, MGMT 324, MGMT 360 and OBHR 330.
Should be taken only in last semester of senior year.
An extensive study of management problems in business at policy-making levels; primarily for students majoring in management.

MGMT 461. MANAGEMENT OF OPERATIONS.
Class 3, cr. 3.
Prerequisite: MGMT 306 or consent of instructor.
An introductory course concerned with the management of production, distribution, and service system operations. The topics covered include facilities planning, job design, materials control, and the management of product quality.

MGMT 465. FORECASTING FOR MANAGEMENT.
Class 3, cr. 3.
Prerequisite: MGMT 225.
Not open to students with credit in ECON 465.
A course examining the statistical techniques of forecasting. Emphasis is placed on time-series data and computer based methods of estimation and testing of marketing and financial data will be studied.

MGMT 490. PROBLEMS IN MANAGEMENT.
Cr. 1-4.
Arrange with instructor before enrolling.
Investigation in a specific management field.

MGMT 503. FINANCIAL ACCOUNTING II.
Class 3, cr. 3.
Must be preceded by MGMT 351.
Advanced course in financial accounting. A range of contemporary issues in financial reporting such as business combinations, consolidations, price-level adjustments, multinationals, and partnership accounting are covered. Both technical proficiency and user applications are emphasized.

MGMT 504. TAX ACCOUNTING.
Class 3, cr. 3.
Must be preceded by MGMT 350.
Basic tax course designed to provide an understanding of the various federal insurance contribution, self-employment and unemployment taxes.

MGMT 505. MANAGEMENT ACCOUNT II.
Class 3, cr. 3.
Prerequisite: MGMT 201 or departmental permission
Topics covered include decentralized financial performance measurement, cost analysis techniques, costs in planning and decision models, and financial control systems.

MGMT 506. AUDITING.
Class 3, cr. 3.
Must be preceded by MGMT 351 and 225.
The systematic verification of financial statements including a study of the responsibilities, liabilities, and ethics of the independent Certified Public Accountant.

MGMT 507. ADVANCED FEDERAL INCOME TAXES.
Class 3, cr. 3.
Prerequisite: MGMT 504 or equivalent.
Advanced course in federal income taxes, with a brief study of gift and estate taxes. Some issues covered in MGMT 504 are studied in more depth, particularly taxation of corporations and partnerships. The course, which is taught in seminar format, gives the student considerable practice in doing tax research and reporting conclusions. It is especially appropriate for the student entering a career in a tax environment.

MGMT 508. ACCOUNTING FOR NON-PROFIT ORGANIZATIONS.
Class 3, cr. 3.
Prerequisite: MGMT 351.
A fund accounting course for non-profit organizations. Accounting for government entities, colleges and universities, hospitals, and other non-profit organizations are included. In addition, analysis and interpretation of not-for-profit organization statements are covered.

MGMT 512. FINANCIAL INSTITUTIONS AND MARKETS.
Class 3, cr. 3.
Must be preceded by MGMT 310 or MGMT 610.

Not open to students with credit in MGMT 412.

Analysis of management policy of financial institutions, including liquidity management, liability management, asset management, and capital management; description of the legal, economic, and regulatory environments and their implications for management. Emphasis on commercial bank management.

MGMT 516. INVESTMENT MANAGEMENT.

Class 3, cr. 3.

Not open to students with credit in MGMT 445.

Treatment of problems of portfolio analysis, capital markets, and securities investment selection. Theoretical development and practical applications, at the level of the individual decision-maker.

MGMT 545. MANAGEMENT INFORMATIONS SYSTEMS.

(CS 545)

MGMT 583. SMALL BUSINESS MANAGEMENT.

Class 3, cr. 3.

Must be preceded by three hours of accounting or consent of instructor. Open only to seniors and graduate students.

Analysis of problems and opportunities specifically related to the small company.

MGMT 600. FINANCIAL ACCOUNTING

Class 3, cr. 3.

A course dealing primarily with uses of accounting and financial information by nonaccounting executives in business decision. Students first learn the basic concepts underlying the preparation of financial statements and cost information; then emphasis is placed upon the uses of such information. Included among the topics are: projection of future results of operation and financial requirements, cost control, cost-price relationships, make-or-buy decisions and product selection.

MGMT 601. MANAGERIAL ACCOUNTING.

Class 3, cr. 3.

Must be preceded by MGMT 600 or consent of instructor.

Among the topics covered in this course are: planning capital expenditures, measurement of management efficiency, establishment and administration of budgetary control systems, management's custodianship responsibility, and government regulations related to cost and accounting information.

MGMT 611. FINANCIAL MANAGEMENT II.

Class 3, cr. 3.

Long-term capital structure planning, capital budgeting, treatment of uncertainty in investment decisions, security underwriting, dividend policies, and mergers.

MGMT 612. FINANCIAL MANAGEMENT III.

Class 3, cr. 3.

Must be preceded by MGMT 611.

Further treatment of topics in the financial management of nonfinancial corporations, from the viewpoint of the internal financial officer. Emphasis on applications.

MGMT 620. MARKETING MANAGEMENT.

Class 3, cr. 3.

For students in the management graduate program or by consent of school.

An integrated analysis of major marketing decisions, including product, pricing, advertising, distribution, and sales force politics.

MGMT 621. MARKETING COMMUNICATION.

Class 3, cr. 3.

Must be preceded by MGMT 620.

Topics in marketing analysis with emphasis on the management of new product ventures, advertising, personal selling and marketing information systems.

MGMT 630. LEGAL AND SOCIAL FOUNDATIONS OF MANAGEMENT.

Class 3, cr. 3.

For students in the management graduate programs or by consent of school.

An examination of the nature of the legal environment from the viewpoint of the social and moral bases of law. Emphasis is given to the operation of our legal system and its significance in decision functions of management.

MGMT 650. STRATEGIC MANAGEMENT.

Class 3, cr. 3.

Must be preceded by MGMT 611 and 620.

For students in the management graduate programs or by consent of school.

An advanced course to integrate previous graduate training in functional areas of industrial administration. The viewpoint taken is that of the general manager and total enterprise management. Special emphasis given to strategic and corporation planning.

MGMT 660. OPERATIONS MANAGEMENT.

Class 3, cr. 3.

Must be preceded by MGMT 601, 611, 620 and 670 and taken concurrently with MGMT 671, or consent of instructor.

For students in the management graduate programs or by consent of instructor.

Technique and methods employed by managers to plan and control manufacturing and other operating systems.

MGMT 661. MANAGEMENT OF OPERATING SYSTEMS.

Class 3, cr. 3.

A project course in which students are exposed to a variety of operations problems as they arise in a real world setting. The focus of the course is problem formulation, analysis, and proposal(s) of an implemental scheme for their resolution.

MGMT 670. QUANTITATIVE METHODS I.

Class 3, cr. 3.

For students in the management graduate programs or by consent of instructor.

Introduction to quantitative decision procedures under uncertainty. Application of probability models. Bayesian inference, queueing models, hypothesis testing, and regression analysis to management problems.

MGMT 671. QUANTITATIVE METHODS II.

Class 3, cr. 3.

Must be preceded by MGMT 670.

Applications of linear algebra, linear programming, integer programming, network models, and convex programming to management problems.

MGMT 690. ADVANCED PROBLEMS IN MANAGEMENT.

Cr. 1-4.

Admission by consent of department.

Advanced investigation in a specific management field at the graduate level.

MATERIALS ENGINEERING

MSE 200. MATERIALS SCIENCE.
Class 3, cr. 3.
Prerequisite: CHM 115 or equivalent.
An introductory course designed to provide a basic background in the broad field of materials science. Emphasis place on the chemical and physical principles underlying the utilization and behavior of metals, alloys, ceramics, composites, and aggregates in engineering.

MSE 344. MATERIALS IN ENGINEERING.
Class 2, Lab. 3, cr. 3.
Prerequisite: MSE 200.
Introduction to the structure and mechanical and physical properties of engineering materials. Selection of metals, alloys, plastics, ceramics, and composites for engineering applications. Strengthening methods and environmental effects. Analysis of the failure of materials under load. Laboratory experiments include mechanical testing, metallography, thermal treatment, and failure analysis.

MSE 385. NONDESTRUCTIVE TESTING.
Class 3, cr. 3.
Prerequisites: MSE 200, PHYS 261 or equivalent.
Basic principles and common application of nondestructive testing methods. The laws of physics are used to evaluate mechanical and physical properties of materials. The NDT methods cover magnetic, penetrants, eddy current, ultrasonic, radiography, and specialized methods.

MSE 575. TRANSPORT PHENOMENA IN SOLIDS.
Class 3, cr. 3.
Prerequisite: senior standing in engineering or science.
Energetics and kinetics of phase changes in metals and alloys. Nucleation and growth models with special emphasis on role of crystal defects. Selected topics in multicomponent diffusion.

MSE 576. CORROSION.
Class 3, cr. 3.
Prerequisite or corequisite: CHM 373 or MSE 344.
Rate-controlling steps in electrode processes; activation, ohmic, and concentration polarization; passivation; potentiostatic studies and alloy design; application to engineering systems.

MSE 597. SELECTED TOPICS IN MATERIALS ENGINEERING.
Hours and credits to be arranged.

MSE 597A. THE PHYSICAL CHEMISTRY OF IRON AND STEEL PRODUCTION.
Class 3, cr. 3.
Prerequisites: ME 305 and MSE 344 or equivalent.
A study of physical chemistry and thermodynamics applied to iron and steel production. Topics treated include metal-slag equilibria and the reactions of the important steelmaking elements.

MSE 597B. PHASE TRANSFORMATIONS AND PHYSICAL PROPERTIES.
Class 3, cr. 3.
Prerequisite: MSE 344 or equivalent.
A detailed study of recovery, recrystalization and grain growth in metals and alloys and the correlation of these solid state phenomena with the physical properties of the materials involved. Emphasis is placed on the theoretical principles involved and their industrial applications.

MSE 597D. MECHANICAL BEHAVIOR OF MATERIALS.
Class 3, cr. 3.
Prerequisite: MSE 344 or equivalent.
The elastic and plastic behavior of materials and correlation of these with structural properties. Performance of materials during industrial deformation processes and fracture.

MUSIC HISTORY AND THEORY

MUS 200. VOICE CLASS.
Class 1, Lab. 3, cr. 2.
(May be repeated one time with permission of the instructor.)
A course of study in singing technique through examination of proper breathing, accurate tone placement, correct vowel formation, and precise diction. Study material will be varied and represent standard vocal literature.

MUS 203. MUSIC FOR ELEMENTARY TEACHERS.
Class 1, Lab. 2, cr. 2.
An undergraduate methods course to provide future teachers in the elementary school with the knowledge, skills, and resources necessary to enhance the regular classroom situation with meaningful and varied musical experiences, and to execute the same with confidence, creativity, and enthusiasm.

MUS 250. MUSIC APPRECIATION.
Class 3, cr. 3.
An introduction to the understanding of music. How to listen to its materials. A study of the media, forms styles, and composers through recorded, live, and film media. Methods used in the structure of music as well as the aesthetic values present in music are also emphasized.

MUS 301. CHOIR.
Lab. 2, cr. 1.
(May be repeated three times for a maximum of 4 credits.)
Study, rehearsal, and performance of choral music.

MUS 355. AMERICAN MUSICAL THEATRE.
Class 3, cr. 3.
(Identical to THTR 355.)
A study of the origins, history, artistry, and unique qualities of American Musical Theatre.

MUS 399. MUSIC TOUR.
Lab. 4, cr. 2.
Prerequisite: consent of instructor.
(May be taken concurrently with A&D 399 and/or
THTR 399. May be repeated for credit if sites visited are different.
A course designed to expose students to musical works and historical sites of musical interest outside the immediate area. The musical world will be observed in relation to the worlds of art and theater.

MUS 490. GUIDED READING IN MUSIC.
Cr. 1-6.
The course is offered for students with specialized needs and interests in the field.

NUCLEAR ENGINEERING

NUCL 501. NUCLEAR ENGINEERING PRINCIPLES.
Class 3, cr. 3.
Prerequisite: graduate standing in engineering or consent of instructor.
A first course for the graduate students desiring a nuclear engineering sequence. Nuclear structure; nuclear radiations; neutron behavior while slowing down and diffusing; fast and thermal reactor theory; and control.

NURSING

NUR 148. MEMBER OF THE DISCIPLINE OF NURSING I.
Class 1, cr. 1.
This course introduces the student to the role(s) of the nurse within the health care delivery system. emphasis is placed on the introduction of nursing roles, self-growth, legal accountability, and values clarification. The process of mentoring is utilized to facilitate student growth within the discipline of nursing.

NUR 151. APPLIED MATHEMATICS FOR NURSES.
Class 1, cr. 1.
This course is designed to integrate previously acquired mathematical skills with the calculation principles essential for the safe preparation and administration of all drug forms.

NUR 152. PRINCIPLES OF NURSING.
Class 2, Lab. 6, cr. 4.
Corequisites: BIOL 203, PSY 120, CHEM 199, NUR 151.
This introductory nursing course utilizes scientific principles and the nursing process to investigate concepts related to basic human needs. Development of cognitive and psychomotor skills aimed at meeting human needs and supporting adaptation are emphasized.

NUR 160. PRINCIPLES OF PSYCHOSOCIAL NURSING.
Class 2, Lab. 3, cr. 3.
Prerequisite: PSY 120.
Principles of human development across the lifespan are examined within the context of a nursing framework. Within each developmental level, health and mat- urational crisis and associated behavioral responses are explored. Emphasis is placed on the importance of self-awareness in the nurse and the utilization of therapeutic communication techniques. The concept of caring in the provision of holistic nursing care is integrated throughout the course.

NUR 161. PRINCIPLES OF ASSESSMENT.
Class 2, cr. 2.
Prerequisite: NUR 152.
Corequisites: NUR 162, BIOL 204.
This course utilizes assessment as the first step in the nursing process as an organizing framework for identifying biopsychosocial data that affect a persons health status. Through a human systems approach the student nurse will develop the cognitive skills necessary to perform assessment. Emphasis is placed on developing an organized and holistic approach to health assessment and its relationship to the nursing process.

NUR 162. ADULT NURSING I.
Class 3, Lab. 6, cr. 5.
Prerequisite: NUR 152.
Corequisites: NUR 161, BIOL 204, PCTX 201.
This course utilizes the nursing processing in the investigation of health problems with predictable outcomes. Emphasis is placed on the application of principles of nursing science for the holistic care of adults. Concepts related to health teaching, medical-surgical interventions, medication administration, and pain management are emphasized.

NUR 250. MEMBER OF THE DISCIPLINE OF NURSING II.
Class 2, cr. 2.
Prerequisite: Completion of all freshman level courses
Challenges and issues surrounding the role transition from student nurse to member of the discipline of nursing are introduced. Career development, legal rights and responsibilities, ethical standards of practice, the clarification of values, the development of a power base in nursing and the influence of caring and commitment to a profession are discussed as dynamic forces for socialization into the discipline of nursing.

NUR 251. NURSING OF THE CHILDBEARING FAMILY
Class 1, Lab. 6, cr. 3.
Prerequisite: completion of all freshman level nursing courses.
Corequisites: BIOL 220.
The nursing process is utilized to provide a holistic and caring response to the woman and her family throughout the childbearing years. Students are introduced to the more common complications of antepartal, intrapartal, postpartal and neonatal period. Emphasis is placed on assisting the woman and family to understand and adapt to the predictable physiological, psychosocial, developmental, and environmental stresses surrounding childbearing.

NUR 252. MENTAL HEALTH NURSING.
Class 1, Lab. 6, cr. 3.
Prerequisite: Completion of all freshman level nursing courses
Corequisites: BIOL 220.
A holistic approach to mental health nursing examines the behavioral themes, social interactive patterns, and the treatment modalities for persons with emotional illness. Emphasis is placed on self-awareness, the use of self as a therapeutic tool and the nursing process in the management of persons with acute psychiatric problems. Creating a therapeutic milieu that promotes dignity and personal legal rights is demonstrated.

NUR 260. CHILDREN'S HEALTH.
Class 2, Lab. 3, cr. 3.
Prerequisite: Completion of all freshman level nursing courses.
Corequisites: BIOL 220.
The nursing process is utilized to assess the impact of illness on the development and health of the child, infancy through adolescence. This course emphasizes the holistic care of ill children within a family unit.

NUR 261. MANAGER OF CARE.
Class 1, Lab. 6, cr. 3.
Prerequisite: Completion of all freshman nursing courses.
Corequisites: NUR 251 & NUR 252, NUR 260 & 262.
This course provides theoretical and practical direction in management of care for a group of patients. Development of skill in critical thinking, decision making, priority setting, time management, and organization is emphasized in the laboratory setting. Issues and protocols related to cost containment and appropriated utilization of health team members are introduced.

NUR 262. ADULT NURSING II.
Class 4, Lab. 6, cr. 6.
Prerequisite: Completion of all freshman level nursing courses.
Corequisites: BIOL 220.
This course utilizes the nursing process in the investigation of complex or multiple health problems with unpredictable outcomes. Emphasis is place on principles of nursing science and advanced techniques of nursing practice for the holistic care of adults. Concepts related to immune disorders, basic life support, mechanical ventilation, life threatening arrhythmia

detection, and multiple intravenous access management are introduced.

NUR 299. GUIDED STUDY IN NURSING.
Class 1-6, cr. 1-6.
Designed to provide core curriculum requirements in nursing for individual students enrolled in the baccalaureate program.

NUR 364. CONCEPTS, THEORIES AND ISSUES OF PROFESSIONAL NURSING.
Class 2, cr. 2.
The Baccalaureate Nursing Program philosophy, conceptual framework, and curricular plan are discussed. Nursing theories are examined in relation to the professional socialization of the baccalaureate prepared nurse. Movements and trends influencing professional nursing practice are analyzed. Accountability for professional development, characteristics of the professional nursing role, and related value systems are analyzed. Students integrate various concepts through group interaction with peers, faculty, and community leaders on issues related to professional nursing practice.

NUR 365. HEALTH ASSESSMENT.
Class 2, Lab. 3, cr. 3.
Prerequisite or corequisite: NUR 364.
Advanced health assessment skills are utilized to interview and examine patients from young adulthood through old age. Health parameters are defined and adjustments to health deviations are evaluated. The focus is on wellness with the identification of variations from normal and development of mutually accepted health goals. The nursing process is utilized to formulate care plans. The role of the professional nurse as an educator/counselor is emphasized.

NUR 366. CONCEPTS OF COMMUNITY HEALTH.
Class 2, cr. 2.
Prerequisite or corequisites: NUR 364.
The community as a setting for the provision of health care is examined. Biostatistics are utilized in the study of epidemiological concepts as they relate to the community. Environmental, cultural, social and political influences are analyzed to evaluate community health. Traditional and evolving community health nursing roles are explored to determine the impact of these roles on changing health care delivery systems.

NUR 367. CONCEPTS OF FAMILY HEALTH.
Class 3, cr. 3.
Prerequisite or corequisite: NUR 364.
Family dynamics and health needs throughout the family's life cycle are examined. A family assessment is used as a data base for planning, implementing and evaluating preventive and therapeutic health care for the purpose of assisting families toward their optimal level of functioning. Skills in critical thinking and application of theory are examined thus enhancing the role of the professional nurse in caring for families.

NUR 374. HEALTH TEACHING AND HEALTH PROMOTION.
Class 2, Lab. 3, cr. 3.
Prerequisites or corequisites: NUR 364, NUR 365, NUR 366, NUR 367.
This course provides opportunities from a conceptual and practical perspective to explore the dynamics that contribute to effective health education. The educative process is analyzed as a vehicle for the promotion of health in individuals and groups in the community. Students apply teaching-learning strategies and evaluate the effectiveness of these strategies on individual and group health promotion activities. The effectiveness of health teaching as a means of influencing society to embrace actions that improve the quality of life for individuals is examined. The professional nursing roles of educator, patient advocate, change agent and practitioner are discussed in relation to health teaching and health promotion.

NUR 375. NURSING RESEARCH.
Class 2, cr. 2.
Prerequisite or corequisite: NUR 364.
An examination of the research process provides a basis for understanding and evaluating the relevance of research findings for nursing practice. The steps of the research process are reviewed along with guidelines for evaluating each of these steps and determining applicability of results to nursing practice.

NUR 376. COMMUNITY HEALTH I.
Class 2, Lab. 3, cr. 3.
Prerequisites or corequisites: NUR 374, NUR 375.
Physical, social, cognitive and emotional development of children from infancy through adolescence is examined in a community setting using age appropriate assessment techniques and screening tools. Health problems, disease prevention and health promotion are addressed through the application of the nursing process. Health care agencies that provide services for children and their families are explored.

NUR 399. SPECIAL TOPICS.
Class 0-4, Lab. 0-6, cr. 1-6.
Hours, credit, and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

NUR 415. PATHOPHYSIOLOGIC PROCESSES.
Class 3, cr. 3.
Prerequisite: Junior level standing or consent of instructor.
The most common morbidity problems manifested in patients in the middle to late adult years are studied. Pathophysiologic concepts and physiologic adaptive responses are integrated with the nursing process. Through the use of research, specific nursing interventions are designed.

NUR 470. COMMUNITY HEALTH II.
Class 3, Lab. 6, cr. 5.
Prerequisites or corequisites: NUR 374, NUR 375.
Roles of the professional nurse in various community health settings are implemented. The developmental approach in studying health needs of the community is continued as the nursing process is applied to evaluate the young, middle-aged and geriatric adult populations. Families within the community are assessed to determine environmental influences that may affect health needs, responses to illness and the rehabilitative process.

NUR 471. CRITICAL CARE NURSING.
Class 2, Lab. 6, cr. 4.
Prerequisites or corequisites: NUR 374, NUR 375.
An overview of critical illness affecting the cardiovascular, renal, nervous, and pulmonary systems is provided. The impact of internal and external environmental changes on the critically ill patient and family is examined. Emphasis is placed on the application of the nursing process to the critical care environment. Students analyze the

role of technology in the critical care setting.

NUR 472. PRECEPTORSHIP IN PROFESSIONAL NURSING PRACTICE I.
Class 1, cr. 1.
Prerequisite: Senior standing or consent of instructor.
A variety of professional nursing roles are examined in terms of professional attributes required. Issues impacting these professional nursing roles are analyzed. Students identify a professional nursing role to be implemented during the preceptorship experience. Faculty guide students in the selection of a professional nursing role and preceptor, preceptorship practice area, and development of learning objectives.

NUR 480. LEADERSHIP AND MANAGEMENT IN NURSING.
Class 2, cr. 2.
Prerequisites or corequisites: NUR 472 and NUR 481.
this course examines leadership and management theories applicable to professional nursing practice. Students apply concepts of leadership-followership, power, communication, conflict management, change and decision making to case studies. Methods of performance appraisal, quality assurance and fiscal management are introduce.

NUR 481. PRECEPTORSHIP IN PROFESSIONAL NURSING PRACTICE II.
Class 1, Lab. 6, cr. 3.
Prerequisite: NUR 472.
Prerequisite or corequisite: NUR 480.
Through a clinical preceptorship, students are guided in an in-depth exploration of a self-selected area of professional nursing practice. The professional nursing roles of collaborator, change agent, leader, manager and utilizer of research are implemented. Concepts of critical thinking, responsibility, accountability, autonomy and decision making are analyzed in relation to professional nursing roles.

NUR 500. THEORETICAL CONSTRUCTS IN NURSING.
Class 3, cr. 3.
Theories in nursing and the related behavioral and natural sciences supporting a conceptual construct for analyzing a holistic conceptual system for nursing are examined. The health consumer seeking to maintain an adaptive state within a dynamic ecological system is evaluated.

NUR 504. HOLISTIC HEALTH PROMOTION.
Class 3, cr. 3.
Cultural considerations as well as the physical, psychosocial and spiritual behavior patterns are examined to assess their impact upon health promotion practices. The roles of nutrition, stress management and communication are analyzed for their influence on both clients and health care providers.

NUR 506. PATHOPHYSIOLOGY.
Class 3, cr. 3.
Prerequisite: Graduate student status or consent of instructor.
This course is designed to examine common clinical concepts of disease processes of adult clients. Based on current research, pathophysiological processes are explored, compensatory mechanisms investigated and rationale for interventions appraised.

NUR 510. NURSING RESEARCH.
Class 3, cr. 3.
Design and methods for clinical research in nursing and related health disciplines are emphasized. Analysis of the research process, application of research in clinical practice and evaluation of outcomes are stressed. A research proposal and pilot study are required.

NUR 512. CARDIOVASCULAR NURSING I.
Class 3, cr. 3.
Prerequisites: NUR 500, NUR 504, NUR 506, NUR 510.
Holistic health concepts, current theories and research related to acute cardiovascular disorders are examined. Appropriate theories are utilized in developing holistic approaches to nursing care of clients experiencing acute cardiovascular disorders. Roles of the cardiovascular clinical specialist are integrated throughout the course.

NUR 514. CARDIOVASCULAR NURSING PRACTICUM I.
Lab. 9, cr. 3.
Corequisite: NUR 512.
Correlation of major maladaptive processes with changes that occur in clients with acute cardiovascular problems is stressed. The application of nursing process to assess and manage acute health care problems and promote the client's self-care agency is emphasized. Health assessment and management modalities are evaluated.

NUR 518. ADULT HEALTH NURSING I.
Class 3, cr. 3.
Prerequisites: NUR 500, NUR 504, NUR 506, NUR 510.
Holistic health concepts, current theories and research related to acute adult health disorders are examined. Appropriate theories are utilized in developing holistic approaches to nursing care of clients experiencing or having the potential for experiencing psycophysiological maladaptations resulting from adult health disorders. Philosophical perspectives and role of the adult health clinical specialist are integrated throughout the course.

NUR 520. ADULT HEALTH NURSING PRACTICUM I.
Lab. 9, cr. 3.
Corequisite: NUR 518.
Correlation of major maladaptive processes with changes that occur in adult clients with common, acute health care problems is stressed. The application of nursing process to assess and manage episodic health care problems, and promote the client's self-care agency is emphasized. Health assessment and management modalities are evaluated.

NUR 599. SPECIAL TOPICS IN NURSING.
Variable credit 1-6.
Prerequisite: Graduate standing or consent of instructor.
Special topics in nursing are critically examined. Hours, credit and subject matter are determined by staff.

NUR 612. CARDIOVASCULAR NURSING II.
Class 3, cr. 3.
Prerequisites: NUR 512, NUR 514.
Theory and research relevant to alternative approaches to the care of clients and families experiencing chronic cardiovascular maladaptations are addressed. The role of the cardiovascular clinical nurse specialist in caring for chronically ill clients is analyzed. Emphasis is placed on adaptation, health maintenance and restorative interventions.

NUR 614. CARDIOVASCULAR NURSING PRACTICUM II.
Lab. 9, cr. 3.
Corequisite: NUR 612.
Correlation of common maladaptive processes with changes that

occur in clients with chronic cardiovascular problems is stressed. The application of nursing process to assess and manage chronic health care problems and promote the client's self-care agency is emphasized. Management modalities are evaluated and redesigned to achieve an adaptive state. Clinical practice may be in a variety of health care settings.

NUR 618. ADULT HEALTH NURSING II.
Class 3, cr. 3.
Prerequisite: NUR 518, NUR 520.
Concepts, theories and research relevant to the care of clients and families experiencing psychophysiological maladaptation secondary to chronic conditions are examined. Nursing interventions are designed to restore or maintain an adaptive client state with emphasis on health maintenance and restorative nursing measures. Philosophical perspectives and advanced clinical specialist roles are addressed in an integrated manner throughout the course.

NUR 620. ADULT HEALTH NURSING PRACTICUM II.
Lab. 9, cr. 3.
Corequisite: NUR 618.
Correlation of major maladaptive processes with changes that occur in adult clients with chronic health care problems is stressed. The application of nursing process to assess and promote the client's self-care agency is emphasized. Health assessment and management modalities are evaluated in a variety of settings.

NUR 655. SEMINAR FOR PROFESSIONAL NURSING PRACTICE.
Class 1, cr. 1.
Prerequisite or corequisites: NUR 514, or NUR 520.
Movements and trends influencing the development of modern nursing are analyzed. Opportunity for dialogue with leaders and peers on topics related to study interests, research projects, nursing and role issues is provided.

NUR 664. PRINCIPLES OF CLINICAL LEADERSHIP.
Class 2, cr. 2.
Prerequisites or corequisites: NUR 514, or NUR 520.
Theoretical approaches to understanding the rationale for designing interventions and analyzing the results of health care are evaluated. Emphasis is placed on utilization of principles and theories as a frame of reference for clinical leadership.

NUR 660. CURRICULUM DEVELOPMENT IN NURSING.
Class 3, cr. 3.
Prerequisite: NUR 500 or consent of instructor.
Theories of curriculum development, instructional design, and evaluation of educational programs are applied to the adult learner in nursing. Educational needs are analyzed, objectives and content designed, and possible learning strategies evaluated.

NUR 662. TEACHING STRATEGIES FOR NURSING.
Class 1, Lab. 6, cr. 3.
Prerequisite: NUR 660.
Theories of learning and motivation are applied to developing teaching strategies in a clinical practice field or the teaching of nursing under the guidance of a faculty member. Implementation of teaching activities and effectiveness of instructional materials are evaluated.

NUR 666. PRINCIPLES OF ADMINISTRATION FOR A HEALTH CARE UNIT.
Class 3, cr. 3.
Managerial functions and responsibilities are analyzed. Emphasis is placed on planning organizing, implementing and controlling health care services. Interdisciplinary concerns are discussed and service outcomes evaluated.

NUR 668. PRACTICUM IN ADMINISTRATION OF A HEALTH CARE UNIT.
Lab. 9, cr. 3.
Prerequisite: NUR 666.
Theories of administration are applied to analyzing a health service in a select clinical setting with the guidance of a faculty member and an administrative preceptor. Organizational problems are identified and plans are developed to improve the functional organization of the service.

NUR 670. PRACTICUM IN NURSING RESEARCH.
Variable credit 1-6. (Amount of credit to be determined by nature and extent of the assignment.)
Prerequisite: NUR 510 or consent of instructor.
Students participate in nursing research projects under the guidance of the faculty. This plan of individualized instruction may be used in any area of nursing specialization, education, or administration.

NUR 698. RESEARCH: MASTER'S THESIS.
Variable credit 1-6.
Prerequisite: NUR 510 and consent of instructor.
Open to students who elect an optional functional track in research. The student enrolls with the faculty member directing the thesis.

ORGANIZATIONAL BEHAVIOR

OBHR 330. BEHAVIORAL SCIENCES IN ADMINISTRATION.
Class 3, cr. 3.
Prerequisite: Junior standing desirable.
An integrated social science approach to administrative problems and administrative behavior. Behavior in organizations is examined in the context of psychological and sociological principles with attention given to such problems as motivation, influence, communication, leadership, small group processes, and organizational change. Emphasis is placed on the development of theoretical and empirical skills in diagnosing and responding to interpersonal problems as well as experience-based learning.

OBHR 430. LABOR RELATIONS.
Class 3, cr. 3.
Prerequisite: a basic course in economic theory or consent of the department.
The course focuses on employee-employer relations under collective bargaining. Attention is also given to topics in trade union development and structure, wage analysis, the problem of economic insecurity, the role of government in labor relations, and employment aspects of the civil rights movement.

OBHR 431. HUMAN RESOURCE MANAGEMENT.
Class 3, cr. 3.
A study of the human resource management function in the business firm. Traditional line and staff relationships are discussed. Motivation, job design, and aspects of the legal environment of human resource management are analyzed.

OBHR 433. HUMAN RESOURCE PLANNING, SELECTION, AND PLACEMENT.
Class 3, cr. 3.
Prerequisite: OBHR 431.

An examination of the theory and practice of human resource planning, selection, and placement. The course will link human resource planning to organization-wide strategic planning. Selection devices as well as validation and reliability strategies are discussed. The implications of legal requirements for hiring practices are investigated.

OBHR 434. BENEFITS ADMINISTRATION.
Class 3, cr. 3.
Prerequisite: OBHR 431.
A study of the historical, financial, motivational, and substantive aspects of employee benefits. Emphasis will be placed on practical administration. Consideration will be given to issues of productivity, union involvement, and future trends in benefit management.

OBHR 435. COMPENSATION MANAGEMENT.
Class 3, cr. 3.
Prerequisite: OBHR 431.
A study of the theory and practice of employee compensation systems considering monetary topics, performance appraisal maintenance, audits of compensation programs and related policy determinations. Issues related to institutional constraints on compensation decisions, internal equity, and individual equity will be discussed.

OBHR 436. COLLECTIVE BARGAINING AND NEGOTIATIONS.
Class 3, cr. 3.
Prerequisite: OBHR 430 and OBHR 431.
Considers current developments in the areas of collective bargaining, negotiations, and third party mediation and arbitration practices. Consideration will be given to the environments, structure, and processes of collective bargaining. Emphasis is on the practical aspects of labor-management negotiation and proceedings.

OBHR 437. MANAGING CAREER DEVELOPMENT.
Class 3, cr. 3.
Prerequisite: OBHR 431.
A consideration of individual- and organization-centered approaches to career development. The seminal theories of career management will be discussed in terms of practical applications. Topics in career and life stage development will be explored. Career path, dual career families, and careers in emerging fields will be discussed. Methods for diagnosing and planning services for employees from diverse backgrounds and at various occupational levels are considered.

OBHR 490. PROBLEMS IN ADMINISTRATIVE SCIENCE.
Cr. 1-4.
Supervised readings and reports in various subjects. Arrange with instructor before enrolling.

OBHR 590. PROBLEMS IN ADMINISTRATIVE SCIENCES.
Cr. 1-4.
Supervised readings and reports in various subjects. Arrange with instructor before enrolling.

OBHR 631. HUMAN RESOURCE SYSTEMS.
Class 3, cr. 3.
Basic concepts involving the human resource management function in the business organization are presented. Line and staff roles, strategic human resource planning, motivation, leadership theory, and personnel techniques are discussed.

OBHR 632. COLLECTIVE BARGAINING.
Class 3, cr. 3.
An in-depth examnination of human resource management in the context of union-management relations. The following subject matter is examined: history of unions, labor law and its application, worker incentives to unionize, organizing campaigns and election outcomes, structure of collective bargaining, contract negotiations, contract content, grievance procedures and arbitration, mediation, union-management cooperation, and the impact of unions on wages, fringe benefits, turnover, absenteeism, etc.

PHARMACOLOGY

PCTX 201. INTRODUCTORY PHARMACOLOGY.
Class 3, cr. 3.
Prerequisite: CHM 119 or equivalent and BIOL 203 or equivalent.
Corequisite: BIOL 204 or equivalent.
An introduction to the pharmacological basis of therapeutics for nursing students. Included are the study of the prescription, weights and measures, nomenclature, posology, dosage forms, therapeutic classifications, and modes of administration. Factors which modify drug action will be discussed, as well as contra-indications and drug reactions and their treatment.

PCTX 301. INTRODUCTORY TOXICOLOGY.
Class 3, cr. 3.
Prerequisite: two semesters of college biology and CHM 319 or equivalent.
Introduction to the principles of toxicology for non-pharmacy majors with special emphasis on industrial and drug problems.

PHILOSOPHY

PHIL 101. THE HISTORY OF PHILOSOPHY.
Class 3, cr. 3.
An introduction to the problems, methods, and main traditions of philosophy through readings in Greek, medieval, modern, and oriental philosophy.

PHIL 106. HUMAN EXPERIENCE IN ART, LITERATURE, MUSIC, AND PHILOSOPHY.
Class 3, cr. 3.
An introductory exploration of some of the pervasive experiences and ideas which lie at the heart of all humanities (e.g. love, death, justice, duty, nature, beauty, and deity) using as material specimens of the visual arts, music, literature, and philosophy.

PHIL 110. INTRODUCTION TO PHILOSOPHY.
Class 3, cr. 3.
The basic problems and types of philosophy, with special emphasis upon the problem of knowledge and nature of reality.

PHIL 111. ETHICS.
Class 3, cr. 3.
A study of the nature of moral value and obligation. Topics such as the following will be considered: different conceptions of the good life and standards of right conduct; the relation of non-moral and moral goodness; determinism, free will, and the problem of moral responsibility; the political and social dimensions of ethics; the principles and methods of moral judgment. Readings will be drawn both from contemporary sources and from the works of such philosophers as Plato, Aristotle, Aquinas, Butler, Hume, Kant, and J.S. Mill.

PHIL 120. CRITICAL THINKING.
Class 3, cr. 3.
This course is intended primarily for students with non-technical backgrounds.
This course is designed to develop reasoning skills and analytic abilities, based on an understanding of the rules or forms as well as the content of good reasoning. The course will cover moral, legal, and scientific reason, in addition to ordinary problem solving.

PHIL. 150. PRINCIPLES OF LOGIC.
Class 3, cr. 3.
A first course in formal deductive logic; mechanical and other procedures for distinguishing good arguments from bad. Truthtables and proofs for sentential ("Boolean") connectives, followed by quantificational logic and relations. Although metatheoretic topics are treated, the emphasis is on methods.

PHIL 206. PHILOSOPHY OF RELIGION.
Class 3, cr. 3.
The nature and origin of religion. A critical examination of the idea of God, the nature of Evil, immorality, and worship.

PHIL 219. INTRODUCTION TO EXISTENTIALISM.
Class 3, cr. 3.
A survey of both the philosophical and more literary writings of the existentialist movement. Readings will be chosen from among the following writers: Kierkegaard, Nietzche, Dostoevsky, Kafka, Marcel, Heidegger, Camus, Sartre, Jaspers, de Beauvoir, Ortega, and Merleau-Ponty.

PHIL 221. PHILOSOPHY OF SCIENCE.
Class 3, cr. 3.
An introduction to the scope and methods of science, and to theories of its historical development. Topics include scientific revolutions, theories of scientific method, the nature of scientific discovery, explanation, science, and values.

PHIL 293. SELECTED TOPICS IN PHILOSOPHY.
Class 1-3, cr. 1-3.
The critical examination of some special topic or topics in philosophy. Details concerning topics selected for treatment in a given semester may be obtained in advance from the department of English and Philosophy. Sections of this course may sometimes be initiated by students upon petition to the department.

PHIL 301. HISTORY OF ANCIENT PHILOSOPHY.
Class 3, cr. 3.
A survey of ancient western philosophy from Thales through Plotinus. Selected readings, examinations, and essays on the pre-Socratic philosophers, Plato, Aristotle, and Hellenistic and Roman philosophy.

PHIL 303. HISTORY OF MODERN PHILOSOPHY.
Class 3, cr. 3.
Concentrates on the major philosophical writers from the Renaissance to the beginning of the nineteenth century: Descartes, Hobbes, Spinoza, Locke, Leibnitz, Berkeley, Hume, Kant. Some in other areas, e.g. Galileo, Newton, Calvin, are also considered.

PHIL 306. TWENTIENTH-CENTURY PHILOSOPHY.
Class 3, cr. 3.
A critical examination of the main currents of contemporary philosophical thought, such as pragmatism, analytic philosophy, phenomenology and existentialism, and other recent developments. This course will cover selected works of such philosophers as Russell, Wittgenstein, Pierce, Whitehead, Heidegger, and Sartre.

PHIL 324. ETHICS FOR THE PROFESSIONS.
Class 3, cr. 3.
A study of the ethical problems faced by professionals in engineering, management, and other professional fields. Topics include: ethical theories, moral decision-making, social responsibility, employee rights and responsibilities, the environment, truth telling, affirmative action, privacy and confidentiality, whistle-blowing, and deception.

PHIL 325. ETHICS AND PUBLIC HEALTH.
Class 3, cr. 3.
A study of the ethical issues and problems of public health and health care. Within public health, such topics will be considered as: ethical theories; laws, codes, values, and moral decision making; the health care system; issues of the health care professional; health care professionals and patients; the sanctity of life; biomedical research and human experimentation; health policy; and allocation of resources.

PHIL 590. DIRECTED READING IN PHILOSOPHY.
Cr. 1-3.
Admission by consent of instructor. Must be preceded by six hours of philosophy, plus basic work in area to be investigated.
(May be repeated for credit.)
A reading course directed by the instructor in whose particular field of specialization the content of the reading falls. Approval of each reading project must be secured from the department.

PHYSICS

PHYS 091. COOPERATIVE WORK EXPERIENCE I.
Cr. 0.
Prerequisite: must be accepted for the program by the departmental Cooperative Education program coordinator.
For cooperative program students only.

PHYS 092. COOPERATIVE WORK EXPERIENCE II.
Cr. 0.
Prerequisite: PHYS 091.

PHYS 093. COOPERATIVE WORK EXPERIENCE III.
Cr. 0.
Prerequisite: PHYS 092.

PHYS 094. COOPERATIVE WORK EXPERIENCE IV.
Cr. 0.
Prerequisite: PHYS 093.

PHYS 095. COOPERATIVE WORK EXPERIENCE V.
Cr. 0.
Prerequisite: PHYS 094.

PHYS 096. WORK EXPERIENCE I.
Cr. 0.
Prerequisite: student must be accepted for the program by the Departmental Professional Practice Program Coordinator.
For Professional Practice Program students only.

PHYS 097. WORK EXPERIENCE II.
Cr. 0.
Prerequisite: PHYS 096.

PHYS 098. WORK EXPERIENCE III.
Cr. 0.
Prerequisite: PHYS 097.

PHYS 099. WORK EXPERIENCE IV.
Cr. 0.
Prerequisite: PHYS 098.

PHYS 107. CONCEPTUAL PHYSICS FOR HUMANITIES.
Class 3, cr. 3.
A descriptive, non-mathematical explanation of physical laws and theories, phenomena, and practical applications. Topics: mechanics, properties of matter, heat, and waves.

PHYS 108. CONCEPTUAL PHYSICS FOR HUMANITIES.
Class 3, cr. 3.
A descriptive, non-mathematical explanation of physical laws and theories, phenomena and practical applications. Topics: electricity, magnetism, light, and modern physics.

PHYS 152. MECHANICS.
Class 4, Lab. 2, cr. 4.
Prerequisite or corequisite: MA 164 or equivalent.
Statics, uniform and accelerated motion; Newton's laws; circular motion; energy, momentum, and conservation principles; dynamics of rotation; gravitation and planetary motion; hydrostatics and hydrodynamics; simple harmonic motion and wave motion.

PHYS 218. GENERAL PHYSICS.
Class 4, Lab. 2, cr. 2.
Prerequisites: MA 148 or equivalent.
Mechanics, heat, and sound, primarily for technology students.

PHYS 219. GENERAL PHYSICS.
Class 4, Lab. 2, cr 4.
Prerequisite: PHYS 218.
Electricity, light, and modern physics, primarily for technology students.

PHYS 220. GENERAL PHYSICS.
Class 3, Lab. 2, cr. 4.
Prerequisite: MA 148 or MA 154 or equivalent.
Mechanics, heat and sound, for science students not specializing in physics, chemistry, or engineering.

PHYS 221. GENERAL PHYSICS.
Class 3, Lab. 2, cr. 4.
Prerequisite: PHYS 220.
Electricity, light, and modern physics, for science students not specializing in physics, chemistry, or engineering.

PHYS 251. HEAT, ELECTRICITY, AND OPTICS.
Class 5, Lab. 2, cr. 5.
Prerequisite: PHYS 152 or equivalent.
Corequisite: MA 261 or equivalent.
Heat, kinetic theory, elementary thermodynamics, heat transfer. Electrostatics, current electricity, electromagnetism, magnetic properties of matter; geometrical and physical optics.

PHYS 261. HEAT, ELECTRICITY, AND OPTICS.
Class 5, cr. 4.
Prerequisite: PHYS 152; prerequisite or corequisite: MA 261 or equivalent.
Heat, kinetic theory, elementary thermodynamics, heat transfer. Electrostatics, current electricity, electromagnetism, magnetic properties of matter; geometrical and physical optics.

PHYS 270. SPECIAL TOPICS IN PHYSICS.
Cr. 1-5.
Admission by special permission. (May be repeated for credit.)
Specialized topics in physics.

PHYS 310. INTERMEDIATE MECHANICS.
Class 4, cr. 4.
Prerequisite: MA 261 and PHYS 251 or 261 or equivalent.
For students familiar with calculus. Elements of vector algebra; statics of particles and rigid bodies; theory of couples; principle of virtual work; kinematics; dynamics of particles and rigid bodies; work, power, and energy; elements of hydromechanics and elasticity.

PHYS 322. OSCILLATIONS AND WAVES.
Class 3, cr. 3.
Prerequisite: PHYS 251 or equivalent.
Modes of vibration of a system; emission and absorption of waves; properties of sound, electromagnetic, and particle waves including phenomena of refraction, reflection, dispersion, diffraction, interference, polarization, double refraction.

PHYS 330. INTERMEDIATE ELECTRICITY AND MAGNETISM.
Class 3, cr. 3.
Prerequisite: PHYS 251 or equivalent; prerequisite or corequisite: MA 262 or equivalent.
Electrostatics; electric currents; magnetostatics; electromagnetic induction; Maxwell's equations; electromagnetic waves.

PHYS 342. MODERN PHYSICS.
Class 4, cr. 3.
Prerequisite: PHYS 251 or 261.
A survey of basic concepts and phenomena in atomic, nuclear, and solid state physics.

PHYS 343. MODERN PHYSICS LABORATORY.
Lab. 2, cr. 1.
Corequisite: PHYS 342.
Laboratory experiments to accompany PHYS 342.

PHYS 350. INTERMEDIATE LABORATORY I.
Class 1, Lab. 3, cr. 2.
Prerequisite or corequisite: PHYS 322.
Lectures on geometrical optics; instructor demonstrations and student experiments involving mechanical and electromagnetic wave and oscillation phenomena.

PHYS 351. INTERMEDIATE LABORATORY II.
Class 1, Lab. 3, cr. 2.
Prerequisite or corequisite: PHYS 330.
Lectures on AC circuit theory; instructor demonstrations and student experiments involving particle diffraction, wave polarization, double refraction, AC circuits, and meters.

PHYS 352. INTERMEDIATE LABORATORY III.
Class 1, Lab. 3, cr. 2.
Prerequisites: PHYS 342 and 351.
Lectures and experiments on electromagnetic waveguides for wavelengths from the microwave to radio region, photoelectric effect, energy levels in atoms, magnetic susceptibility. Compton effect, nuclear line spectra, nuclear magnetic resonance.

PHYS 470. SPECIAL TOPICS IN PHYSICS.
Cr. 1-5.
Admission by special permission. (May be repeated for credit.)

PHYS 500. FUNDAMENTAL PHYSICS I.
Class 1, Lec.-Dem. 2, cr. 2.
Prerequisite: a course in college physics. Admission by consent of instructor.
A review of mechanics, wave motion, and kinetic theory, and the extensions of the laws in these domains to relativity and current investigations and applications. The course is specifically designed for teacher of science in the secondary schools.

PHYS 501. PHYSICAL SCIENCE I.
Class 3, cr. 3.
Prerequisite: a course in college Physics.
A survey of the Physical sciences with emphasis on the overlap of astronomy, physics, chemistry, and

geophysics. Consideration of appropriate methods of presentation and demonstration of experiments in physical science for the elementary school.

PHYS 502. PHYSICAL SCIENCE II.
Class 3, cr. 3.
Prerequisite: PHYS 501 or consent of instructor.
A continuation of PHYS 501 with emphasis on electricity, optics and modern physics.

PHYS 503. FUNDAMENTAL CONCEPTS OF PHYSICS.
Class 3, cr. 3.
Prerequisite: a course in college physics.
Admission by consent of instructor.
An intensive review of the principles of physics specifically designed for teachers of the physical sciences in high school. Special emphasis will be placed on mechanics, kinetic theory, electric and magnetic fields, and the propagation of electromagnetic radiation.

PHYS 504. PRINCIPLES OF PHYSICS I.
Class 2, cr. 2.
Prerequisite: college physics and mathematics through calculus.
A review of classical physics, with emphasis on the unifying principles operating in the various domains. Stress will be placed on the operational approach, the conservation principles, and the field theory law of gravitation and electromagnetism. Designed primarily for secondary school teachers.

PHYS 506. FUNDAMENTAL PHYSICS II.
Class 1, Lec.-Dem. 2. cr. 2.
Prerequisite: PHYS 500 or equivalent.
An intensive review of electricity, magnetism and light, and an introduction to quantum phenomena and atomic and nuclear structure. The course is specifically designed for teachers of science in the secondary schools.

PHYS 508. INTRODUCTION TO THEORETICAL PHYSICS I.
Class 3, cr. 3.
Prerequisite or corequisite: PHYS 504.
Vector algebra and calculus; dynamics of particles and rigid bodies; gravitation and planetary motion; oscillations and waves; thermodynamics. Designed primarily for secondary school teachers.

PHYS 509. INTRODUCTION TO THEORETICAL PHYSICS II.
Class 3, cr. 3.
Prerequisite: PHYS 508 or equivalent.
Kinetic theory and statistical mechanics; electromagnetism and Maxwell's equations; physical optics; wave mechanics. Designed primarily for secondary school teachers.

PHYS 510. PHYSICAL MECHANICS.
Class 3, cr. 3.
Prerequisites: PHYS 310 or equivalent.
PHYS 330 or equivalent and MA 262 or equivalent.
Mechanics of particles, rigid bodies, and vibrating systems; elasticity and hydrodynamics; theory of relativity.

PHYS 515. THERMODYNAMICS.
Class 3, cr. 3.
Prerequisite: PHYS 310 and MA 262 or equivalent.
Fundamental concepts of heat; theory and practice of heat measurements; first and second laws of thermodynamics, with applications.

PHYS 517. STATISTICAL PHYSICS.
Class 3, cr. 3.
Prerequisites: PHYS 342, 510, and 515 or equivalent.
Kinetic theory of gases, third law of thermodynamics, and the principles of statistical mechanics, with applications to the quantum theory of radiation and the theory of specific heats.

PHYS 530. ELECTRICITY AND MAGNETISM.
Class 3, cr. 3.
Prerequisite: PHYS 330 or equivalent.
An introductory theoretical course. Vector analysis; electrostatic problems; theory of dielectrics,; theory of conduction; thermoelectric and photoelectric phenomena; electromagnetic effects due to steady and changing currents; magnetic properties of matter; Maxwell's equations; radiation.

PHYS 542. SURVEY OF MODERN PHYSICS I.
Class 3, cr. 3.
Prerequisites: general physics and calculus.
Restricted for graduate credit to candidates in education or science teaching.
Elementary particles. Relativity. Quantum theory. Atomic spectra and X-rays. Pauli principle. Wave mechanics. Radiation and statistics.

PHYS 545. SOLID STATE PHYSICS.
Class 3, cr. 3.
Prerequisites: PHYS 550 or equivalent.
Crystal structure; lattice vibrations and electronic band structure of crystals; electrical, optical, and thermal properties of solids; transport and other nonequilibrium phenomena in uniform and nonuniform materials.

PHYS 549. SURVEY OF MODERN PHYSICS II.
Class 3, cr. 3.
Prerequisite: PHYS 542 or equivalent.
Solid state physics; nuclear particles and forces; natural and artificial radioactivity; particle accelerators; nuclear reactions; fission and fusion. Designed primarily for secondary school teachers.

PHYS 550. INTRODUCTION TO QUANTUM MECHANICS.
Class 3, cr. 3.
Prerequisites: PHYS 310, 330, and 342, MA 362 or 510, or equivalent.
Brief historical survey of the development of quantum mechanics; waves in classical physics, wavepackets, uncertainty principle wave functions, operators, expectation values of dynamical observables: Schrodinger equation with application to one-dimensional problems, the hydrogen atom; electron spin, periodic table; selected topics in perturbation theory, scattering theory and compounding angular momenta. Designed for students needing quantum mechanics background for specialty courses such as PHYS 545, 556, and 564.

PHYS 564. INTRODUCTION TO ELEMENTARY PARTICLE PHYSICS.
Class 3, cr. 3.
Prerequisite: PHYS 550 or 552 or equivalent
Historical survey of the discovery of elementary particles. Methods of detecting charged particles. Modern particle accelerators. Kinematics and quantum mechanics of scattering and decay of particles; conservation of four-momentum and angular momentum; phase space. Charge structure of particles; form factors. Strong interactions; resonances in pion-nucleon and pion-pion systems; effective mass, Dalitz and Chew-Low plots;

qualitative introduction to Feynman diagram techniques in single particle exchange process; T, C, P invariance; isospin; strangeness, G-Parity; Gell-Mann-Nishijima formula. Electromagnetic and weak interactions; violation of strong interaction symmetries, interpretation of particle spectra in terms of SU(3) symmetry, the quark model, and Regge theory.

PHYS 566. INTRODUCTORY NUCLEAR PHYSICS.
Class 3, cr. 3.
Prerequisite: PHYS 550 or equivalent.
Theory of relativity, brief survey of systematics of nuclei and elementary particles, structure of stable nuclei, radioactivity, interaction of nuclear radiation with matter, nuclear reactions, particle accelerators, nuclear instruments, fission, nuclear reactors.

PHYS 571. SELECTED TOPICS IN PHYSIC.
Class 3, cr. 3.
Specialized topics in physics selected from time to time.

PHYS 590. READING AND RESEARCH.
Cr. 1-3.

POLITICAL SCIENCE

POL 100. AMERICAN PUBLIC AFFAIRS.
Class 3, cr. 3.
A survey of current public affairs in America designed to help students become conscious of the societal issues of our times.

POL 101. AMERICAN GOVERNMENT AND POLITICS.
Class 3, cr. 3.
A study of the nature of democratic government, the U.S. Constitution, federalism, civil rights, political dynamics, the presidency, Congress, and the judiciary.

POL 114. POLITICAL BEHAVIOR.
Class 3, cr. 3.
An introduction to the major dimensions of citizen politics in America; voting behavior, political socialization of children and adults, political opinion and culture, leadership recruitment and partisan participation.

POL 120. INTRODUCTION TO PUBLIC POLICY AND PUBLIC ADMINISTRATION.
Class 3, cr. 3.
This course provides an introduction to the fields of public policy and public administration. Processes of policy formation and administration are examined. Different approaches to evaluating and improving public policies are discussed.

POL 130. INTRODUCTION TO INTERNATIONAL RELATIONS.
Class 3, cr. 3.
Introductory survey of major foreign governments, including the governments of a western democracy, a communist state, and a developing country, with special attention to the historical, cultural, and constitutional development, the organization and ideologies of political parties, and current political problems.

POL 141. INTRODUCTION TO COMPARATIVE POLITICS.
Class 3, cr. 3.
Introductory survey of major foreign governments, including the governments of a western democracy, a communist state, and a developing country, with special attention to the historical, cultural, and constitutional development, the organization and ideologies of political parties, and current political problems.

POL 190. THE POLITICS OF CHANGE.
Class 3, cr. 3.
An introductory survey of the political forces at play in the processes of social, economic, and political change. Among topics to be considered are the politics of: the post-industrial revolution, environmental control, civil rights, the role of women in society, international cooperation and conflict. Emphasis will be placed on the political forces and processes involved in change and the resultant public policies.

POL 231. INTRODUCTION TO UNITED STATES FOREIGN POLICY.
Class 3, cr. 3.
This course is designed to introduce students to the major themes and issues in contemporary United States foreign policy. Lectures, discussions and readings will examine such areas as United States relationships with the major powers, the Third World and international organizations.

POL 261. THE WORLD OF IDEAS I.
Class 3, cr. 3.
The first half of a two-semester chronological sequence based on reading and discussion source materials and documents drawn from Political Science, Economics, History, Sociology, Psychology, and Philosophy. This course is designed to familiarize students with the major ideas and ideals which have shaped world civilization. Major themes of this course are Liberty, Human Nature, and The Individual Society.

POL 262. THE WORLD OF IDEAS II.
Class 3, cr. 3.
The second half of a two-semester chronological sequence based on reading and discussion primary source materials and documents drawn from Political Science, Economics, History, Sociology, Psychology, and Philosophy. This course is designed to familiarize students with the major ideas and ideals which have shaped world civilization. Major themes of this course are Liberty, Human Nature, and The Individual and Society.

POL 300. INTRODUCTION TO POLITICAL ANALYSIS.
Class 3, cr. 3.
An introduction to the study of politics, its basic concepts and major areas of concern; also review of important research techniques, including methods of data collection and analysis.

POL 302. INTRODUCTION TO POLITICAL ANALYSIS.
Class 3, cr. 3.
An introduction to the study of politics, its basic concepts and major areas of concern; also review of important research techniques, including methods of data collection and analysis.

POL 302. INTRODUCTION TO POLITICAL THINKING.
Class 3, cr. 3.
An introductory study of political concepts and systems of political thought from classical to modern times.

POL 311. CONGRESS AND THE PRESIDENT.
Class 3, cr. 3.
An analysis of policy formation which stresses the linkage between the Congress and the President.

Legal, behavioral, and normative approaches will be considered.

POL 315. PUBLIC OPINION AND ELECTIONS.
Class 3, cr. 3.
Prerequisite: POL 101 or 104 or consent of instructor.
Contemporary public opinion, political socialization, and voting behavior in America.

POL 320. INTRODUCTION TO PUBLIC POLICY ANALYSIS.
Class 3, cr. 3.
Prerequisite: POL 101
Examination of public policy analysis models and approaches and current public policy questions. The course will emphasize application of analytical methods to the examination of contemporary policy issues in the United States.

POL 330. POLITICS OF LAKE COUNTY.
Class 3, cr. 3.
The study of Lake County politics focusing upon the selection of political leaders; the relation of the county to municipalities, townships, the state and federal government and public policy. Party officials and government office holders will be a resource for the course.

POL 333. POLITICAL MOVEMENTS.
Class 3, cr. 3.
Prerequisite: POL 100 or 101 or consent of instructor.
A study of political change ranging from legal reform to peaceful protest to violent revolution. Emphasis on ideologies and strategies of change relevant to consideration of contemporary political change.

POL 343. INTRODUCTION TO THE CRIMINAL JUSTICE SYSTEM.
Class 3, cr. 3.
Prerequisite: POL 101, SOC 100 or consent of instructor.
Not open to students with credit in SOC 343.
A study of the agencies and processes involved in the criminal justice system: legislatures, the courts, the police, the prosecutor, the public defender, and corrections. An analysis of the roles and problems of each component with an emphasis on their interrelationships.

POL 346. LAW AND SOCIETY.
Class 3, cr. 3.
Prerequisite: POL 101 and SOC 100 or consent of instructor.
Nature and development of law and legal institutions in historical, comparative, and contemporary perspectives; interrelationships of law, morality, and custom; legal change and social change; and the legal profession.

POL 353. CURRENT POLITICAL IDEOLOGIES.
Class 3, cr. 3.
Liberalism, conservatism, socialism, fascism, communism, and other political ideologies.

POL 354. CIVIL LIBERTIES AND THE CONSTITUTION.
Class 3, cr. 3.
A study of the politics of civil rights and liberties in the United States focusing upon the Constitution, legislation, court decisions, and executive implementation.

POL 370. INTRODUCTION TO COMPARATIVE STATE POLITICS.
Class 3, cr. 3.
An introduction to the structure and process of state government, including the legal and political relationships between the state and local units of government.

POL 371. INTRODUCTION TO COMPARATIVE URBAN POLITICS.
Class 3, cr. 3.
The politics of governing urban areas, including the selection of political leaders, and citizen participation in the decision making of the central city. Special attention will be given to the integration of minorities into the political and social life of the city.

POL 372. INDIANA GOVERNMENT AND POLITICS.
Class 3, cr. 3.
An examination of the political and governmental organization of the State of Indiana. Includes the political and historical development of Indiana state government and comparison of policies and institutions with those of other states.

POL 380. THE POLITICS OF BUREAUCRACY.
Class 3, cr. 3.
An examination of bureaucratic organization in government. Organization theory and internal politics, foundations of bureaucratic power, and the relationship between bureaucracies and political culture, parties, pressure groups, and other structures of government.

POL 400. PRINCIPLES OF EMPIRICAL POLITICAL ANALYSIS.
Class 3, cr. 3.
Prerequisite: POL 300 or consent of instructor.
An intermediate critical treatment of the scientific approach to the study of political behavior. Focus on the advantages and problems of analyzing political phenomena in terms of the following elements of scientific methodology: classification, measurement, generalization, verification, reliability, validity, casual inference and prediction. The importance of these elements for understanding politics will be illustrated by analyzing empirical studies drawn from various fields of political behavior.

POL 401. PRACTICUM IN LOCAL GOVERNMENT.
Class 1, Field 5, cr. 3.
Observation and supervised participation on an official community committee or board, in a political campaign, or with professional governmental staffs. Readings and class meetings to integrate theory and experience. This course requires five hours per week of field experience.

POL 404. UNITED STATES POLICY-MAKING ELITE.
Class 3, cr. 3.
The role of political elites in a democracy, including consideration of alternative modes of recruitment, circulation, and accountability as viewed by Mills, Mosca, Pareto, and other elite theorists. Focus on how political elites can strengthen or threaten the function of democracy, in modern American society.

POL 428. POLITICS OF REGULATION.
Class 3, cr. 3.
Politics and policies of federal and state regulatory agencies. Explanations of regulatory agency behavior, arguments for and against government regulation, and alternatives to government regulation.

POL 429. CONTEMPORARY POLITICAL PROBLEMS.
Class 3, cr. 3.
(May be repeated for credit with a different title.)
Contemporary political problems in the United States affecting the interpretation of democracy, human rights and welfare, social pressures, and intergovernmental relations.

POL 433. INTERNATIONAL ORGANIZATION.
Class 3, cr. 3.
Prerequisite: POL 130 or consent of instructor.
A study of the structure and functions of the United Nations and associated agencies with an emphasis on the role of this system in contemporary international relations.

POL 435. INTERNATIONAL LAW.
Class 3, cr. 3.
Prerequisite: POL 130 or consent of instructor.
A study of international legal theories, principles, and practices with an emphasis on the role and utility of law in contemporary international relations.

POL 442. THE SOVIET POLITICAL SYSTEM.
Class 3, cr. 3.
Prerequisite: POL 141 or 303, or consent of instructor.
Analysis of Russian political culture and the Russian political tradition. History, organization, and functioning of the Communist Party and the governmental apparatus. The role of the "social organizations," interest groups, and elites. Models of the Soviet political system.

POL 439. UNITED STATES FOREIGN POLICY MAKING.
Sem 1. Class 3, cr. 3.
Prerequisite: POL 130 or consent of instructor.
An analysis of the decision-making process in United States foreign policy.

POL 443. FIELD EXPERIENCE IN CRIMINAL JUSTICE.
Class 1, Field 6, cr. 3.
Prerequisite: Consent of instructor.
(May be repeated once for credit as either POL 443 or SOC 443.)
Observation and supervised participation in the criminal justice system. Readings and class meetings to integrate theory and experience. Intended for students who plan to enter a graduate school of criminal justice or who plan to become employed in the criminal justice system upon receiving the bachelor's degree.

POL 454. SELECTED PROBLEMS IN MATERIALIST POLITICAL THOUGHT.
Class 3, cr. 3.
(May be repeated for credit.)
Discussion and analysis of representative works and major schools of political theory which take a materialistic or naturalistic approach to the description and evaluation of political phenomena, e.g. the thought of Hobbes, or of Marx, or psychoanalytic theories of politics. Emphasizes textural analysis and logical structure of the works examined and considers their applicability to contemporary political life.

POL 460. JUDICIAL POLITICS.
Class 3, cr. 3.
Prerequisite: POL 101 or consent of instructor.
A survey of judicial processes as they operate in America. Both trial courts and appellate courts will be examined in light of the procedures with which they operate. The external social, economic, and political pressures surrounding courts, and the impact courts have on society will be considered.

POL 490. TOPICS IN POLITICAL SCIENCE.
Class 3, cr. 3.
Variable title.
Prerequisite: Sophomore standing and POL 101.
(May be repeated for credit.)

POL 492. INDIVIDUAL STUDIES IN POLITICAL SCIENCE.
Class 3, cr. 3.
(May be repeated for credit.)
Variable title.
An undergraduate individual study course directed by the instructor in whose particular field of specialization the content of the individual study falls. Approval of each individual study course must be secured from the department.

POL 493. INTERDISCIPLINARY UNDERGRADUATE SEMINAR.
Class 1-3, cr. 1-3.
(Same as HIST 493, PHIL 493, PSY 493, SOC 493, and THTR 493.)
Prerequisite: consent of instructor.
(May be repeated for credit.)
An undergraduate seminar devoted to an interdisciplinary examination of social, economic, political, and intellectual movements, using the faculty resources of the participating departments. Subject matter will vary. Each offering of the seminar will be approved by a committee of department heads from the sponsoring departments.

POL 498. INDIVIDUAL STUDIES IN POLITICAL SCIENCE.
Class 3, cr. 3.
(May be repeated for credit-variable title.)
An undergraduate study course directed by the instructor in whose particular field of specialization the content of the individual study falls. Approval of each individual study course must be secured from the department.

POL 510. POLITICAL PARTIES AND POLITICS.
Class 3, cr. 3.
Must be preceded by junior standing or above.
An analysis of the nature and function of U.S. political parties in terms of social and economic forces that shape our political parties, pressure groups, and formal governmental structures are emphasize throughout. Special attention is devoted to political leadership, nominating processes, campaign management, voting behavior, and other important aspects of American politics.

POL 511. CONGRESS: STRUCTURE AND FUNCTIONING.
Class 3, cr. 3.
Must be preceded by junior standing or above.
A study of how Congress actually operates. Formal and informal power structures with both chambers and roles of the individual members of Congress are analyzed. Attention is directed to latent as well as manifest functions of legislative, investigative, and other major activities of Congress. The problem of bringing expertise to bear on the legislative process is considered throughout.

POL 514. THE PRESIDENT AND THE POLICY PROCESS.
Class 3, cr. 3.
Prerequisite: POL 101, 301, or equivalent.
A study of presidential leadership as the embodiment of social forces and as reflective of the personality of the incumbent; the president as national leader reflecting national myths and ideologies; the growth of the presidency; issues and forces affecting the continuity of presidential leadership; degree of institutionalization of the presidency.

POL 522. ENERGY, POLITICS AND PUBLIC POLICY.
Class 3, cr. 3.
Examination of current public policy practices and political questions concerning energy, primarily in the United States. The course will examine the main issues, actors, and policy orientations in relation to

such energy sources as petroleum, electricity, and nuclear power.

POL 542. COMMUNIST POLITICAL SYSTEMS.
Class 3, cr. 3.
Prerequisite: POL 442 or equivalent, or consent of instructor.
Advanced study of selected problems in the politics of Communist countries. The course will focus on such issues as the nationalities problem, political dissent, and opposition in the USSR and other Communist countries; the role of elites and interest groups within the context of a single-party system; as well as specific functions of the ruling Communist Part, e.g., indoctrination, leadership, and recruitment. The place of Communist studies in political science.

POL 560. CONSTITUTIONAL LAW.
Class 3, cr. 3.
Must be preceded by POL 101.
A survey of selected areas of constitutional law, considering the political and social influences as well as the doctrinal forces which have produced these policies and interpretations.

POL 565. CURRENT POLITICAL IDEOLOGIES.
Class 3, cr. 3.
Prerequisite: POL 350.
Democracy, socialism, fascism, communism, and other political ideologies.

POL 590. DIRECTED READING IN POLITICAL SCIENCE.
Cr. 1-3.
(May be repeated for credit.)
A reading course directed by the instructor in whose particular field of specialization the content of the reading falls. Approval of each reading project must be secured from the department.

PSYCHOLOGY

PSY 120. ELEMENTARY PSYCHOLOGY.
Class 3, cr. 3.
Introduction to the fundamental principles of psychology, covering particularly the topics of personality, intelligence, emotion, attention, perception, learning, memory, and thinking.

PSY 203. INTRODUCTION TO RESEARCH METHODS IN PSYCHOLOGY.
Class 2, Lab. 2, cr. 3.
Prerequisite: BHS 201, PSY 201, PSY 500 or equivalent. (Not open to students with credit in PSY 303.)
The use of scientific methods in psychology. Lecturing covers principles of collecting and interpreting data, using examples of research from many areas of psychology. In the laboratory portion the student uses many different techniques from various areas of psychology.

PSY 205. TESTING AND MEASUREMENT.
Class 2, Lab. 2, cr. 3.
Prerequisite: BHS 201 or consent of instructor. (Not open to students with credit in PSY 302 or PSY 505.
Fundamental concepts of test theory, introduction to applied psychological testing, the scale of data, and the interpretation of test results.

PSY 310. SENSORY AND PERCEPTUAL PROCESSES.
Class 3, cr. 3.
Prerequisite: MA 151 or MA 153 or equivalent.
Theory, problems, and research in sensation and perception, including physiological bases and measurement techniques.

PSY 311. HUMAN LEARNING AND MEMORY.
Class 3, cr. 3.
Prerequisite: PSY 500 or BHS 201, or consent of instructor.
Theory and research in verbal learning, attention, discrimination learning, thinking, conceptual and organization processes, memory, and languages.

PSY 314. INTRODUCTION TO LEARNING.
Class 3, cr. 3.
Prerequisite: PSY 120 or equivalent, or consent of instructor.
This course attempts to make clear the theoretical and practical implications of learning principles and findings. Various theories of learning examined and the implications of these theories, and the learning approach generally, for a variety of practical problems are emphasized.

PSY 322. BRAIN AND BEHAVIOR: MOTIVATION AND INTEGRATIVE PROCESSES.
Class 3, cr. 3.
Prerequisite: six hours of psychology.
Neuroanatomical analyses of behavioral functions. Topics include: movement; sexual behavior, maternal behavior; hunger, thirst; emotion; pain; addiction; biological rhythms; memory; evolution of the brain; language; hemispheric specialization; brain damage; brain remodeling during development and aging; correlates of cognitive processing.

PSY 333. MOTIVATION.
Class 3, cr. 3.
Prerequisite: PSY 120 or equivalent, or consent of instructor.
A survey of current research and theory in motivation. The effects of both learned and unlearned motives on behavior are discussed. Examples of topics covered are: hunger, sex, aggression, pain, emotion, stress, frustration, conflict, and needs for achievement, affiliation and power.

PSY 344. HUMAN SEXUALITY.
Class 3, cr. 3.
Prerequisite: PSY 120 or SOC 100.
A nonjudgmental approach to the study of sexuality through attempts to bring to students' awareness their own sexual values. Topics include evaluation of research, biological aspects, varieties of expression, inadequacies, violence, love, erotica, gender identity, aging, and sex laws. (Same as WOST 344)

PSY 349. PSYCHOLOGY OF WOMEN.
Class 3, cr. 3.
Prerequisite: PSY 120.
An examination of the history and sources of concepts which have defined the psychological functioning of women and a critical evaluation of current evidence regarding women and their behavior, examining the influences which affect them in contemporary society, as set within the context of the life cycle. (Same as WOST 349)

PSY 350. ABNORMAL PSYCHOLOGY.
Class 3, cr. 3.
Prerequisite: three hours of psychology.
Various forms of mental disorder from the standpoint of their origin, treatment, prevention, social significance, and relation to problems of normal human adjustment.

PSY 361. HUMAN DEVELOPMENT I: INFANCY AND CHILDHOOD.
Class 3, cr. 3.
Prerequisite: PSY 120 or equivalent, or consent of instructor.

A consideration of the formative years in human development with primary attention given to the processes of socialization, individualization, and adaptation, intiated by retrospective self-examination and furthered by an analysis of systematic life history data.

PSY 362. HUMAN DEVELOPMENT II: ADOLESCENCE.
Class 3, cr. 3.
Prerequisite: PSY 361 or equivalent.
A behavioristically-oriented analysis of social, personality, and cognitive development in adolescence and youth.

PSY 363. HUMAN DEVELOPMENT III: ADULTHOOD.
Class 3, cr. 3.
Prerequisite: PSY 362 or equivalent.
An analysis of growth trends in adulthood as arising from the experiences of childhood and adolescence and as manifesting themselves in the performance of a variety of adult roles. The realization of maturity, as seen in self assessment and examination of systematic life history data. The prospects for later adulthood: involvement versus disengagement.

PSY 370. ENVIRONMENTAL PSYCHOLOGY.
Class 3, cr. 3.
The psychological influence of immediate environment on human and, to a lesser extent, animal behavior. Environmental factors will be considered from the viewpoints of social psychology, applied experimental psychology, consumer psychology, community psychology, and ethology.

PSY 373. PSYCHOLOGY IN INDUSTRY.
Class 3, cr. 3.
Prerequisite: PSY 120. (Not open to students with credit in PSY 570.)
Survey of applications of psychological principles and research methods to personnel selection, training, and appraisal; societal context of work including study of work motivation, satisfaction and alienation, small group dynamics, and leadership.

PSY 374. ORGANIZATION AND BEHAVIOR.
Class 3, cr. 3.
Prerequisite: PSY 120. (Not open to students with credit for PSY 572.)
Survey of basic behavioral science research and thought on organizational behavior as evidenced in individual, group, intergroup, and societal phenomena. The reciprocal relationship between individual work behavior and institutional factors are stressed and analytically reviewed.

PSY 386. CONSUMER BEHAVIOR.
Class 3, cr. 3.
Prerequisite: PSY 120.
Basic concepts and methods of psychology as used to understand consumer behavior. Course covers general concepts (e.g. personality, information-processing, social class, family decision-making) as well as their applications to specific examples of consumer behavior (e.g. information search, product choice, purchase).

PSY 420. INTRODUCTION TO PERSONALITY THEORY.
Sem. 1 and 2. SS.
Class 3, cr. 3.
Prerequisite: three hours of psychology.
Personality theories selected from the traditions of psychoanalysis, behaviorism, and phenomenology-existentialism are presented and contrasted in the fundamental assumptions made by each outlook. Theorists surveyed included Freud, Adler, Jung, Dollard and Miller, Skinner, Bandura, Rogers, Boss, Binswanger, and Kelly.

PSY 428. DRUGS AND BEHAVIOR.
Class 3, cr. 3.
Prerequisite: six credits of psychology.
Discussion of the variety of drugs which affect the nervous system and behavior. Emphasis will be upon a discussion of the physiological and pharmacological bases for the use and misuse of drugs in our society.

PSY 430. SYSTEMS AND THEORIES OF PSYCHOLOGY.
Class 3, cr. 3.
Prerequisites: PSY 203, PSY 505 or PSY 205.
A review of major systems of thought and theories contributing to current developments in psychology. Special emphasis placed on broad approaches to building an understanding of man, both scientific and humanistic including behaviorism, psychoanalysis and humanistic-cognitive approaches.

PSY 433. ISSUES IN DEVELOPMENTAL PSYCHOLOGY.
Class 3, cr. 3
Prerequisite: six hours of psychology. Not open to students with credit in PSY 343.
A survey of current major issues of developmental psychology and relevant and evolving methodological approaches to these problems. The emphasis is on developmental processes and factors affecting these processes.

PSY 443. AGGRESSION AND VIOLENCE.
Class 3, cr. 3.
Prerequisite: consent of instructor.
An intensive examination of the nature of human aggression. Among the topics covered will be: (1) theoretical perspectives concerning such behavior; (2) social conditions that encourage its performance; and (3) means for its prevention and control.

PSY 480. FIELD EXPERIENCE IN PSYCHOLOGY.
Class 1, Exp. 7, cr. 3.
Prerequisite: consent of instructor. (May be repeated once for credit with permission instructor.)
Supervised volunteer field work experiences in a setting appropriate to students' interests and goals. Intended as an opportunity to integrate theory and practice.

PSY 491. TOPICS IN PSYCHOLOGY.
Cr. 1-6.
Variable titles.

PSY 498. SENIOR RESEARCH.
Cr. 3.
(May be repeated for credit.)
Open to senior undergraduate majors in psychology.
Student conducts and writes up an individual research project under the guidance of a member of the staff.

PSY 500. STATISTICAL METHODS APPLIED TO PSYCHOLOGY, EDUCATION, AND SOCIOLOGY.
Class 3, cr. 3.
Not open to students with credit in BHS 201.
Descriptive statistics and an introduction to sampling statistics. Applied to psychological, sociological, and educational data.

PSY 505. MENTAL MEASUREMENT.
Class 2, Lab. 2, cr. 3.
Must be preceded by six hours of psychology, including PSY 500 or equivalent.
Introduction to the general area of mental measurement. Theory and content of measuring devices in the fields of intelligence, interests, personality, and special aptitudes.

PSY 523. INTRODUCTION TO THEORIES OF PSYCHOTHERAPY.
Class 3, cr. 3.
Prerequisite: introductory course in theory of personality advisable, especially for undergraduates (e.g., PSY 420).
A survey of the major approaches to psychotherapy, including their theory of illness and cure. Three traditions are represented: psychoanalytical (e.g., Freud, Adler, Jung), behavioral (e.g., Miller and Dollard, Wolpe, Stampfl), and cognitive-phenomenological (e.g., Rogers, Kelly, Perls).

PSY 532. PSYCHOLOGICAL DISORDERS OF CHILDHOOD.
Class 3, cr. 3.
Prerequisite: six hours of psychology.
A review of the nature, causes, and consequences of deviations from normal childhood development. Emphasis is placed on the two most common types of psychological problems in childhood: mental retardation and behavior disorders.

PSY 535. PSYCHOLOGY OF DEATH AND DYING.
Class 3, cr. 3.
An examination of psychological research and theory related to death and the dying process. Topics include: 1) death concepts, attitudes, and fears—historical and contemporary, 2) definitions and predictors of death (physical, psycho-social predictors of death), effects of death on survivors, psycho-social factors related to individual differences and normative dying behaviors, stages of dying, effects of pain and drugs, managing the dying process.

PSY 550. INTRODUCTION TO CLINICAL PSYCHOLOGY.
Class 3, cr. 3.
Prerequisite: 12 hours of psychology.
The case-study method, including a discussion of the importance of historical information, the contribution of clinical tests to diagnosis, and a general survey of prevention and treatment techniques.

PSY 570. INDUSTRIAL PSYCHOLOGY.
Class 3, cr. 3.
(Not open to students with credit in PSY 373.)
Survey of the applications of psychological principles and of research methodology to the various human problems in industry, such as personnel selection and appraisal, the organizational and social context of human work, the job and work situation, human errors and accidents, and psychological aspects of consumer behavior.

PSY 590. INDIVIDUAL RESEARCH PROBLEM.
Cr. 1-3.
Prerequisite: 12 hours of psychology.
Admission by consent of instructor.
Opportunity for students to study particular problems in any field of psychology or initiate themselves into research techniques under the guidance of a member of the staff.

PSY 600. STATISTICAL INFERENCE.
Class 3, cr. 3.
Prerequisite: PSY 500 or equivalent.
Emphasis is given to principles underlying both parametric and nonparametric inference.

PSY 673. PSYCHOLOGY OF BEHAVIORAL DISORDERS.
Class 3, cr. 3.
Advanced abnormal psychology. Consideration will be given to research and theory of psychopathology.

RESTAURANT, HOTEL AND INSTITUTIONAL MANAGEMENT

RHI 100. INTRODUCTION TO FOOD SERVICE AND LODGING INDUSTRY.
Class 1, cr. 1.
An overview of supervisory careers, opportunities, and responsibilities in the food service and lodging industry.

RHI 181. LODGING MANAGEMENT.
Class 3, cr. 3.
Concepts of organization, communication, ethics, and policy formulation in the front office. Introducing the basic techniques and trends in systems and equipment available to meet the needs of management and the guest.

RHI 191. FOOD SERVICE SANITATION.
Class 3, cr. 3.
The application of sanitary and public health engineering principles to food service and lodging operations.

RHI 212. RESTAURANT, HOTEL AND INSTITUTIONAL ORGANIZATION AND MANAGEMENT.
Class 3, cr. 3.
Prerequisite: RHI 291.
Factors involved in establishing an institution, business policies and decision making, departmental organization, administrative development including management experience; job analysis and evaluation; salary and wage structures; employee benefits; personnel selection and employment practices including allocation of labor.

RHI 231Y. MARKETING IN FOOD SERVICE AND LODGING OPERATIONS.
Class 3, cr. 3.
Development, use, and evaluation of effective merchandising, advertising, and public relations techniques in the hospitality and tourism industries.

RHI 251. COMPUTERS IN THE HOSPITALITY INDUSTRIES.
Class 3, cr. 3.
Prerequisite: CIS 100 or consent of instructor.
Explore the applications of computers in the hospitality industry. Special emphasis is placed on those impacting the management of the organization.

RHI 261. DIETETIC TECHNOLOGY FIELD EXPERIENCE.
Class 1, clinical 6-12, cr. 1-2.
Repeatable to a maximum of 5.
Prerequisite: Limited to enrollment in Dietetic Technician Program.
Clinical experience of at least 450 hours in an approved health care facility in the areas of nutritional principles, patient/client education and counseling, management and supervision of human resources, and food preparation/sanitation/safety at the technician level, under the direction of a Registered Dietitian. Last semester credit shall include full staff responsibility as a Dietetic Technician.

RHI 291. QUANTITY FOOD PRODUCTION.
Class 2, Lab. 6, cr. 4.
Prerequisite: F&N 205 or 203.
Principles of quantity food production, menu planning, and merchandising with experience in each of these areas.

RHI 301. PRACTICUM IN RESTAURANT, HOTEL, AND INSTITUTIONAL MANAGEMENT.
Cr. 1.
Prerequisite: 15 credits in RHI or consent of head of department.
In-service training and practical experience, totaling at least 300 hours, in an approved food service and/or lodging operation.

RHI 302. INDUSTRY PRACTICUM.
Cr. 2.
Prerequisite: consent of instructor.
Industry-related practicum experience in an approved hospitality management operation. Course is different from RHI 301. The experience shall be a minimum of 600 hours. Pass/Not Pass.

RHI 311Y. PURCHASING FOR RESTAURANTS, HOTELS AND INSTITUTIONS.
Class 3, cr. 3.
Prerequisite or corequisite: RHI 291.
Identifies and describes foods, supplies, equipment, furniture, and furnishings important to quantity food service. Provides methods and criteria for recognizing quality and for evaluating, specifying, purchasing, and inspecting these materials for food service use.

RHI 312Y. PERSONNEL MANAGEMENT FOR RESTAURANTS, HOTELS, AND INSTITUTIONS.
Class 3, cr. 3.
Corequisite: RHI 291.
The concepts of management of people for effective operation of restaurants, hotels, and institutions involving supervisory development and communications; the pretesting, training, and evaluating of employees and the development of attitudes and morale of people working together.

RHI 314. FRANCHISING.
Class 3, cr. 3.
Prerequisite: Class 5 standing or higher.
The study of franchise administration, operations and marketing, with a special emphasis on hospitality related franchises. Includes a study of the legal regulation of franchises, the franchisee-franchisor relationship and unique problems in operating a franchise.

RHI 315. PRIVATE CLUB MANAGEMENT AND OPERATION.
Class 3, cr. 3.
A study of the organization, administration, operation, and opportunities within the private club industry with emphasis on the manager's duties.

RHI 321. EQUIPMENT FOR RESTAURANTS, HOTELS, AND INSTITUTIONS.
Class 3, cr. 3.
Prerequisite: RHI 291.
Principles of selection, operation, and maintenance of food service equipment including materials, structural details, design, cost, performance, and specification standards.

RHI 322. RESTAURANT, HOTEL AND INSTITUTIONAL PROPERTY MANAGEMENT.
Class 3, cr. 3.
The systematic internal control of hospitality spaces and equipment to safeguard public health and to utilize available aesthetic values in food and lodging environment.

RHI 323. FOOD SERVICE LAYOUT AND DESIGN.
Class 3, cr. 3.
Prerequisite: RHI 291.
Arrangement of food service equipment for efficient use of space. An introduction to computer aided design for equipment placement with space constraints. Development of work flow pattern and human engineering consideration.

RHI 331. MEETINGS AND CONVENTION SALES AND SERVICES.
Class 3, cr. 3.
Analysis of methods used by hotel-motel sales departments in booking group business. Emphasis on selling, planning for, and servicing all aspects of meeting and convention business.

RHI 341. COST CONTROLS IN FOOD SERVICE AND LODGING.
Class 3, cr. 3.
Prerequisites: MGMT 200 and RHI 312Y.
Application of cost controls; development of cost reduction methods through management policy and decisions; examination of cost control techniques for food, labor, and supplies in addition to the emphasis on beverage management control.

RHI 361. SCHOOL FOOD SERVICE ADMINISTRATION.
Class 2, Lab. 2, cr. 3.
The organization, administration, and operation of the school of food service as an integral part of the total educative program of the child and of the administrative pattern of the school.

RHI 371. INTRODUCTION TO TOURISM.
Class 3, cr. 3.
Principles, practices, and philosophies which affect the economic, social, cultural, psychological, and marketing aspects of human travel and the tourism industry.

RHI 381. EXECUTIVE HOUSEKEEPING.
Class 1, Lab. 4, cr. 3.
Management principles and practices relative to the internal maintenance of public lodging facilities. Experience in room preparation, cleanliness, tools, record keeping, and departmental organization.

RHI 390. UNDERGRADUATE SPECIAL PROBLEMS.
Cr. 0-6.
Repeatable to a maximum of 6 credits.
Open to RHI majors only.
Individual or group participation in supervised reading, laboratory experiences, field experiences, or research in special areas of the field.

RHI 391. SPECIALTY FOOD SERVICE.
Class 1, Lab. 6, cr. 3.
Prerequisite: RHI 291.
Exploration and creative use of specialty foods and unusual cuisine for the hospitality field. Concepts of management for the effective operation of quantity specialty food service organizations within a financial framework involving menu-planning, customer relations, and production-service logistics.

RHI 411. HOSPITALITY LAW.
Class 3, cr. 3.
Prerequisite: RHI 301.
Rights and duties of innkeepers and restauranteurs, civil rights, contracts, negotiable instruments, and types of organizations.

RHI 419. SENIOR SEMINAR IN RHI.
Class 3, cr. 3.
Prerequisite: 15 credits in RHI or consent of instructor.
The presentation and discussion of research currently being conducted or recently completed which is concerned with or related to restaurant, hotel and institutional management.

RHI 441Y. FINANCIAL MANAGEMENT IN FOOD SERVICE AND LODGING.
Class 3, cr. 3.
Prerequisite: RHI 212 and RHI 341.
Financial management applied to Food service, Hotel, and Institutional management facilities. Opera-

tional statement analyses from management decision-making viewpoint. Consideration of various accounting systems and techniques as information centers for management. Emphasis on situations oriented to the hospitality industry.

RHI 491. BEVERAGES AND THEIR MANAGEMENT.
Class 2, cr. 2.
Prerequisite: Must be minimum 21 years of age and RHI major, or consent of instructor.
Principles and practices regarding the production, selection, purchasing, storage, and serving of wines and spirits in the food service industry. Included are methods of creative dining room merchandising and promotion.

RHI 492. ADVANCED FOOD SERVICE MANAGEMENT.
Class 1, Lab. 6, cr. 3.
Prerequisite: RHI 212 and RHI 341.
The assumption of maximum responsibility of the management of an actual food service operation based on sound managerial principles and successful food production techniques.

RHI 499Y. OPERATIONAL ANALYSIS.
Class 3, cr. 3.
Prerequisite: Senior class standing.
Combines all the areas concerned with executive management, marketing, personnel, cost control, etc. Examines the hospitality organization as a total system, with emphasis on strategic planning, system design, and problem analysis.

SCIENCE

SCI 300. INTERDISCIPLINARY SCIENCE AND SOCIAL IMPLICATIONS.
Class 2, Lab. 2, cr. 3.
This course will help the student analyze the impact of evolving scientific knowledge and the resulting technological advances on social, political, and economic systems. Included will be the identification of the effects of chemicals and nutrition on personal well-being. (For secondary science teaching majors.)

SOCIOLOGY

SOC 100. INTRODUCTION SOCIOLOGY.
Class 3, cr. 3.
A survey course designed to introduce the student to the science of human society. Fundamental concepts, description, and analysis of society, culture, the socialization process, social institutions, and social change. A first course for sociology majors and a possible terminal course for non-majors.

SOC 220. SOCIAL PROBLEMS.
Class 3, cr. 3.
Prerequisite: SOC 100 or equivalent.
Contemporary problems at the community, society, and international levels, focusing on patterns of social organization and social change in American society, with concentration on such topics as technological militarism and war, poverty, racism, political protest, and cybernation.

SOC 261. INTRODUCTION TO SOCIAL WORK.
Class 3, cr. 3.
Not open to students with credit in SWRK 261.
Provides a basic overview of the profession of social work—its development as a profession, professional values and ethics, and the multiple settings in which social work is practiced. Instruction is given in the types of social work; i.e., the generic complex which results in individual casework, group work, community practice, administration, and policy. Methods of social work are described, along with the current frameworks for social work practice, including systems and problem solving.

SOC 314. RACE AND ETHNIC RELATIONS.
Class 3, cr. 3.
Prerequisite: SOC 100 or consent of instructor.
(Not open to students with credit in SOC 514.)
An examination of the social, psychological, political, economic, and cultural factors that influence society's treatment of members of various racial and ethnic groups, and those factors that influence the ways those groups interact with each other.

SOC 320. GENERAL SOCIAL ORGANIZATION.
Class 3, cr. 3.
Prerequisite: SOC 100.
The study of selected areas of social organization. Institutions as special forms of organizations. The formal organization and bureaucracies. Theories and empirical studies of power and decision making in organizations. Case studies of American organizations and institutions.

SOC 325. SOCIAL FORCES AND SOCIAL MOVEMENTS.
Class 3, cr. 3.
Prerequisite: SOC 100.
Examines the social, political, economic, and social psychological conditions that give rise to social movements, the ideological perspectives of major social movements, and the inter-relationships between social movements and social change.

SOC 330. CULTURE, ARTS, SOCIETY.
Class 3, cr. 3.
Prerequisite: SOC 100 or consent of instructor.
The relations of the arts to society; the production, diffusion, institutionalization, democratization of the arts, with attention to the consequences of diverse media structures on organization, marketing, and support structures. Emphasis will be placed on related emerging social roles, the connections between art and politics, elite versus mass arts, and the arts and cultural values.

SOC 334. URBAN SOCIOLOGY.
Class 3, cr. 3.
Prerequisite: SOC 100 or equivalent.
Development of the city and its functions: types of social behavior in cities; influences of city life on personality; city planning.

SOC 340. GENERAL SOCIAL PSYCHOLOGY.
Class 3, cr. 3.
Prerequisite: three hours of psychology or of sociology.
(Not open to students with credit for PSY 340.)
Social influences on the individual and processes of social interaction. Individual attitudes and behavior as related to socialization, social norms, social roles, communication and propaganda, and other social influences. Among the interaction processes considered are interper-

sonal attraction, influence, leadership, cooperation, and conflict.

SOC 343. INTRODUCTION TO THE CRIMINAL JUSTICE SYSTEM.
Class 3, cr. 3.
(Not open to students with credit in POL 343.)
A study of the agencies and processes involved in the criminal justice system: legislature, the courts the police, the prosecutor, the public defender, and corrections. An analysis of the roles and problems of each component with an emphasis on their inter-relationship.

SOC 350. SOCIAL PSYCHOLOGY OF MARRIAGE.
Class 3, cr. 3.
Prerequisite: SOC 100 or 312, or equivalent.
(Not open to students who have had CDFS 350.)
Designed to provide an understanding of contemporary courtship, marriage, and family interaction as cultural, social, and social-psychological phenomena. Consideration of the major sources of marital strain and conflict within a heterogeneous, rapidly changing society. (Same as WOST 350)

SOC 361. THE FIELD OF SOCIAL WORK.
Class 3, cr. 3.
Prerequisite: SOC 100 or SOC 312 or equivalent
(Not open to students with credit in SWRK 361.)
Basic concepts and activities of social service organizations. Field trips to selected institutions.

SOC 364. CHILD AND FAMILY WELFARE.
Class 3, cr. 3.
Prerequisites: SOC 261, PSY 361, and PSY 362.
(Not open to students with credit in SWRK 364.)
A review of the family as it is influenced by societal and personal forces. The impact of culture, society, and economics on the family is reviewed: additionally, the personal and interpersonal factors including family crises, breakdowns, unemployment, and alcoholism are considered.

SOC 383. INTRODUCTION TO METHODS OF SOCIAL RESEARCH II.
Class 3, cr. 3.
Prerequisite: BHS 201.
Introduction to the methods of data collection and analysis and to the use of the scientific method in social research. Formulation of hypotheses and research designs for their testing. Elementary principles for the conduct of experiments, observation, and interviewing, documentation; content analysis; and surveys. Relationship between social research and social theory.

SOC 402. PRINCIPLES OF SOCIOLOGY.
Class 3, cr. 3.
Prerequisite: nine hours of sociology.
An advanced critical treatment of the theories, concepts, and methods of sociology. A basic course required of undergraduate majors in sociology.

SOC 411. SOCIAL STRATIFICATION.
Class 3, cr. 3.
Prerequisite: SOC 100 or equivalent.
Examination of systems of class and caste, with special attention to the United States; status, occupation, income, and other elements in stratification.

SOC 412. SOCIAL CHANGE.
Class 3, cr. 3.
Prerequisite: SOC 100 or the consent of the instructor.
The study of social change in premodern and modern societies. The following topics will be included: theories of social change, current patterns of social change in the developing and industrial worlds, changes in socialization patterns, interpersonal relations, social institutions, the impact of social change, the desirability of growth and development and the dilemmas of modernization.

SOC 416. INDUSTRIAL SOCIOLOGY.
Class 3, cr. 3.
Prerequisite: SOC 100.
Provides an overview of the historical development of industrial organizations from craft production through the factory to multinational corporations. Examines changes in managerial practices and ideologies and workers' reactions. Explores other institutions (including government, schools, mass media) affecting industrial development.

SOC 421. JUVENILE DELINQUENCY.
Class 3, cr. 3.
Prerequisite: SOC 100 or equivalent.
A study of social and psychological factors influencing individual delinquent behavior patterns. Emphasis on preventive and rehabilitative programs and the role of community agencies, such as social service agencies, juvenile courts, youth authorities. Visits to selected organizations and institutions.

SOC 422. CRIMINOLOGY.
Class 3, cr. 3.
Prerequisite: SOC 100 or equivalent.
Nature and cause of crime; methods of dealing with adult and juvenile offenders; consideration of present programs for the social treatment of crime in the light of needed changes.

SOC 430. SOCIOLOGY OF AGING.
Class 3, cr. 3.
Prerequisite: SOC 100.
Examination of the theories of aging, problems confronting older persons, and programs designed to assist the elderly. Consideration of social aspects of aging in the U.S. in the areas of retirement, employment, housing, income, health care, and the family relationships with cross-cultural and historical comparisons.

SOC 440. SOCIOLOGY OF HEALTH AND ILLNESS.
Class 3, cr. 3.
Prerequisite: SOC 100.
Examination of the social aspects of health beliefs, the definition of disease, and decisions regarding the seeking of medical care. Identification of major changes in patterns and frequencies of health, sickness, disease, and death in the twentieth century and factors influencing these patterns. Analysis of characteristics of U.S. medical care systems with particular emphasis on the economics and ethics of health care delivery, the production and distribution of medical personnel, and comparisons with other systems.

SOC 443. FIELD EXPERIENCE IN CRIMINAL JUSTICE.
Class 1, Field 6, cr. 3.
Prerequisite: consent of instructor.
(May be repeated once for credit in either SOC 443 or POL 443.)
Observation and supervised participation in appropriate criminal justice agencies. Readings and class meetings will integrate theory and experience. Intended for students who plan to enter graduate school or become employed in a criminal justice agency upon receiving the bachelor's degree.

SOC 450. SEX ROLES IN MODERN SOCIETY.
Class 3, cr. 3.
Prerequisite: SOC 350 or consent of instructor.
A critical examination of the roles of men and women in many societies with particular attention to sex/gender differences and inequalities in the contemporary United States. Origins, goals and tactics of the recent women and men's liberation movements. Sex differences and inequality in the areas of sexuality, marriage, family, education, employment, and income. Social factors which maintain and those which may minimize sex and inequality. A companion course to SOC 550. (Same as WOST 450.)

SOC 460. FIELD EXPERIENCE IN GERONTOLOGY.
Class 1, Field 10, cr. 3.
Prerequisite: SOC 430 and consent of instructor.
Supervised volunteer field experience in a gerontological setting. Intended as an opportunity for practical experience in an organization providing services to older adults, where theoretical concepts can be applied and skills and techniques for dealing with older adults can be developed.

SOC 465. SOCIAL WORK STRATEGIES AND TECHNIQUES.
Class 3, cr. 3.
Prerequisite: SOC 261.
(Not open to students with credit in SWRK 465.)
Emphasis on preparing students for the multiple roles and functions attending social work. Strategies for gathering, organizing, and interpreting social work information, preparation of reports, coordination of referrals and services. Instruction in effective social work techniques.

SOC 466. HUMAN SERVICES AND INTERPERSONAL SKILLS.
Class 3, cr. 3.
Prerequisite: SWRK 462 or consent of instructor.(Not open to students with credit in SWRK 466.)
This course provides a concrete introduction to principles of interpersonal relations in the field of human services. These principles are approached inductively, using field work experiences as a basis for group-based self-analysis and reflection.

SOC 491. TOPICS IN SOCIOLOGY.
Cr. 1-6.
Variable titles.

SOC 514. RACIAL AND CULTURAL MINORITIES.
Class 3, cr. 3.
Prerequisite: SOC 100 or equivalent.
America's minority groups; immigration; interracial and intercultural conflicts; assimilation.

SOC 525. SOCIAL MOVEMENTS.
Class 3, cr. 3.
Prerequisite: SOC 100 or equivalent.
Origins and developmental stages of revolutionary and reform movements and communitarian societies; relation between social structure and political attitudes; personality needs and affinity for social and political ideologies.

SOC 530. POLITICAL SOCIOLOGY.
Class 3, cr. 3.
Prerequisite: SOC 100, SOC 312 or equivalent.
Analysis of the social and social psychological sources of routine political participation such as voting and interest group activity and non routine political action such as protest movements and revolution; the organization of power at the community, national and international level; and political ideology.

SOC 531. COMMUNITY ORGANIZATION.
Class 3, cr. 3
Prerequisite: SOC 100 or equivalent.
Analysis of the local community in terms of its institutional structure, relationships among institutions, political and economic power relationships, and the role of voluntary organizations and interest groups.

SOC 532. DEMOGRAPHY—HUMAN ECOLOGY.
Class 3, cr. 3.
Prerequisite: six hours of sociology, incl. SOC 334 or equivalent and consent of instructor.
Evaluation of population theories including implications for modern industrial and non industrial societies; introduction to population policies, migration, fertility, and mortality. The ecological perspective is also developed, and major research traditions with this perspective are also developed, and major research traditions with this perspective are examined. Appropriate methodologies will be considered.

SOC 550. GENDER IDENTITY AND SEX ROLE DIFFERENTIATION.
Class 3, cr. 3.
Prerequisite: SOC 350 or 450, or consent of instructor.
Psychosexual differentiation, both prenatal and postnatal; normal and deviant processes involved in establishing gender identity and in functioning within a sex role setting. Some attention to hermaphroditism, transsexualism, and homosexuality. The masculinity-femininity dimension of personality; sex role structures and sex role learning within a societal context. A companion course to SOC 450.

SOC 553. THE SOCIOLOGY OF THE FAMILY.
Class 3, cr. 3.
Prerequisite: SOC 100, 312 or equivalent.
The family as an ongoing institution, subject to forces such as culture, economics, social class, religion, and education, which affect family structure and internal familial processes of social control and integration. Consideration of the means by which the family effects changes in other institutions and in individuals. Use of historical data to augment study of current changes in family structure and functions.

SOC 562. PUBLIC SOCIAL SERVICES.
Class 3, cr. 3
Prerequisites: SOC 100, 312, or equivalent.
Activities and responsibilities of governmental agencies in meeting social needs. Emphasis on changing philosophies and changing social values, together with their implementation into these services.

SOC 570. SOCIOLOGY OF EDUCATION.
Class 3, cr. 3.
Prerequisite: SOC 100 or equivalent.
Analysis of the American public school as a social organization. Includes: interrelations among community power structure, social stratification, and the school; the roles of superintendent, principal, and teacher in community and school; the classroom as a social system; student culture; and teaching as a profession.

SOC 572. RELIGION IN AMERICAN SOCIETY.
Class 3, cr. 3.
Prerequisite: SOC 100, 312 or consent of instructor.
Examination of organized religion in America, including beliefs and practices of major American faiths, inter-faith images, dimensions and consequences of religious involvement, types of church structure, churches as community organizations, intergroup conflict, and types of ecumenical activity.

SOC 590. INDIVIDUAL RESEARCH PROBLEMS.
Cr. 1-3.
Prerequisite: consent of instructor. (May be repeated for credit.)
Individual research or reading in an area of sociology under a sociology department staff member. Does not include thesis work.

SOC 591. SELECTED TOPICS IN SOCIOLOGY.
Cr. 1-3.
Prerequisite: SOC 100 or equivalent.
(May be repeated for a maximum of six credit hours.)

SPANISH

SPAN 101. SPANISH LEVEL I.
Class 3, Lab., cr. 3.
Introduction to Spanish.

SPAN 102. SPANISH LEVEL II.
Class 3, Lab. 1, cr. 3.
Prerequisite: SPAN 101.
Continuation of SPAN 101.

SPAN 201. SPANISH LEVEL III.
Class 3, cr. 3.
Prerequisite: SPAN 102 or equivalent.
A conversational approach to the cultures of Spain and South America with a review of Spanish language skills as needed.

SPAN 202. SPANISH LEVEL IV.
Class 3, cr. 3.
Prerequisite: SPAN 201 or equivalent.
Continuation of SPAN 201 and the presentation of intellectual readings.

SPAN 230. CONTEMPORARY SPANISH AMERICAN LITERATURE IN TRANSLATION.
Class 3, cr. 3.
Reading and discussion of selected masterpieces of twentieth century Latin American prose fiction and essays in translation. Emphasis on works written after World War II. Knowledge of Spanish not required.

SPAN 261. SPANISH COMPOSITION.
Class 3, cr. 3.
Prerequisite: SPAN 202 or may be taken concurrently with SPAN 202 with instructor's approval.
The essential of Spanish grammar as applied in composition.

SPAN 307. COMMERCIAL SPANISH.
Class 3, cr. 3.
Prerequisite: SPAN 202 or equivalent.
This course will provide students with the fundamentals of effective expression and communication as these apply to Spanish business situations in particular. It will concentrate on commercial vocabulary, reading, writing, and speaking as related to international business.

SPAN 313. SPANISH FOR SPANISH SPEAKERS I.
Class 3, cr. 3.
Prerequisite: native speaking ability in Spanish as determined by placement test; not open to student who have had SPAN 365 and SPAN 261.
The presentation of the structure and phonology of Spanish in Spanish for those who come from native-speaking backgrounds but who require the formal training. Grammar, composition, and standard Spanish fluency.

SPAN 314. SPANISH FOR SPANISH SPEAKERS II.
Class 3, cr. 3.
Prerequisite: SPAN 313 or native speaking ability in Spanish and consent of the department head.
A continuation of SPAN 313 with the presentation of levels of Spanish speech, intellectual readings and compositions, grammar problems.

SPAN 365. SPANISH CONVERSATION.
Class 3, cr. 3.
Prerequisite: SPAN 202 or may be taken concurrently with SPAN 202 with instructor's approval.
Intensive practice in Spanish conversation. Patter practice, preparation and delivery of dialogues and topical talks. Introduction to basic phonetics and practice in pronunciation.

SPAN 373. SPANISH TRANSLATION.
Class 3, cr. 3.
Prerequisite: SPAN 261, 313, or equivalent.
An introduction to the principles of translation. Practice in translation from Spanish to English and vice versa. Selected, graded materials from simple to moderate difficult, illustrating a variety of styles. Acquaintance with reference materials concerning Spanish and English translations.

SPAN 405. INTRODUCTION SPANISH LITERATURE I.
Class 3, cr. 3.
Prerequisite: SPAN 202.
Introduction to the periods of Spanish literature from the beginning through the eighteenth century. Reading and discussion of representative works. The rudiments of literary criticism.

SPAN 406. INTRODUCTION TO SPANISH LITERATURE II.
Class 3, cr. 3.
Prerequisite: SPAN 202.
Introduction to the periods of Spanish literature from the eighteenth century to the present. Reading and discussion of representative works. The rudiments of literary criticism.

SPAN 408. LANGUAGE PRACTICUM IN BUSINESS.
Cr. 3.
Prerequisite: completion of 261, 307, 365 with B or better; classification 5 or higher; GPA 4.5; and departmental approval.
(May be repeated once for credit if experience is different.)
The course will consist of actual on-the-job experience in international corporations, industry, commerce, government, or health and social agencies where Spanish is used. The course is designed to expose students to their chose vocational field.

SPAN 413. CULTURE OF SPANISH-SPEAKING AMERICANS.
Class 3, cr. 3.
Prerequisite: SPAN 202 or consent of instructor.
An introduction to the cultural heritage and customs of groups of Spanish-speaking Americans, such as Mexican-Americans, Puerto-Rican Americans, Cuban Americans. The nature of the social processes, points of interference between cultures. Historical and geographical perspectives of Spanish-speaking Americans.

SPAN 414. LITERATURE OF SPANISH SPEAKING AMERICANS.
Class 3, cr. 3.
Prerequisite: SPAN 202 or consent of instructor.

The study of the literature of Chicano and Puerto Rican authors. Poetry, plays, short stories and novels presented in survey form so as to cover fairly themes from each Spanish-speaking population segment in contemporary American life. Intermediate knowledge of Spanish is needed because of dialecticism in many of the contemporary works.

SPAN 435. SPANISH AMERICAN LITERATURE TO MODERNISM.
Class 3, cr. 3.
Prerequisite: SPAN 202.
The study of the development of Spanish American literature from the early chronicles to the end of the nineteenth century with consideration of the pre-hispanic background.

SPAN 436. SPANISH AMERICAN LITERATURE FROM MODERNISM TO PRESENT.
Class 3, cr. 3.
Prerequisite: SPAN 202.
A continuation of SPAN 435. The study of the development of Spanish American literature beginning with the Modernist period to the present.

SPAN 451. SPANISH CIVILIZATION.
Class 3, cr. 3.
The study of modern Spanish life with regard to the social institutions and customs. Lectures in the language.

SPAN 461. INTERMEDIATE SPANISH COMPOSITION.
Class 3, cr. 3.
Prerequisite: SPAN 261.
A continuation of SPAN 261. In this course, stress is given to the development of more complex grammar and its application in the written language. Emphasis is placed on the structure of composition and basic refinement and precision brought about by grammar and vocabulary.

SPAN 465. INTERMEDIATE SPANISH CONVERSATION.
Class 3, cr. 3.
Prerequisite: SPAN 365.
Continued and more advanced practice in Spanish conversation and the study of phonetics for accuracy in pronunciation and intonation. Students are encouraged to study contemporary culture as a basis for their conversations.

SPAN 473. INTERMEDIATE SPANISH TRANSLATION.
Class 3, cr. 3.
Prerequisite: SPAN 373, or permission of instructor.
The continuation of SPAN 373 to include more extensive and more difficult translations. Also, a presentation of theoretical concepts concerning translation, and an orientation to research materials for translation purposes.

SPAN 490. TOPICS IN SPANISH.
Class 3, cr. 3.
Prerequisite: SPAN 202, or permission of instructor.
(May be repeated for credit.)
Variable title.

SPAN 511. ADVANCED SPANISH CONVERSATION.
Class 3, cr. 3.
Prerequisite: SPAN 465.
Additional practice in speaking and understanding Spanish. Talks based on material given in class.

SPAN 515. ADVANCED SPANISH COMPOSITION.
Class 3, cr. 3.
Prerequisite: SPAN 261 or consent of instructor.
Additional training in writing Spanish.

SPAN 541. SPANISH LITERATURE OF THE GOLDEN AGE.
Class 3, cr. 3.
Prerequisite: SPAN 405.
A survey of Spanish literature from 1500 to 1681. Reading and discussion of representative prose, dramatic and poetic works. Lectures and supplemental readings on literary criticism and on various aspects of the period useful to an understanding of the literature it produced.

SPAN 546. THE SPANISH NOVEL FROM REGIONALISM THROUGH THE GENERATION OF '98.
Class 3, cr. 3.
Prerequisite: SPAN 406.
The study of the nineteenth-century novel from the costumbristas to Galdos. The social and aesthetic preoccupations of the Generation of '98. Lectures and readings from representative authors.

SPAN 547. CONTEMPORARY SPANISH NOVEL.
Class 3, cr. 3.
Prerequisite: SPAN 406.
The contemporary novel as an insight into twentieth century Spanish life and thought. Analysis of selected authors.

SPAN 548. EARLY SPANISH PROSE: ORIGINS TO THE LAZARILLO.
Class 3, cr. 3.
Must be preceded by SPAN 405.
Spanish prose, principally the narrative, from the thirteenth century to the middle of the sixteenth. Reading and discussion of representative works from the beginnings of Castilian prose up to Lazarillo de Tormes.

SPAN 552. SPANISH AMERICAN LITERATURE FROM 1900 TO 1940.
Class 3, cr. 3.
Prerequisite: SPAN 436.
A survey of Spanish American Literature from Modernism to 1940. Reading and discussion of a number of representative works as well as excerpts from several others.

SPAN 553. SPANISH AMERICAN LITERATURE FROM 1940 TO THE PRESENT.
Class 3, cr. 3.
Prerequisite: SPAN 436.
A survey of Spanish American Literature from 1940 to the present. Reading and discussion of a number of representative works as well as excerpts from several others.

SPAN 555. CHICANO AND PUERTO RICAN WRITERS.
Class 3, cr. 3.
Prerequisite: Any 400-level course in Hispanic literature.
A survey of the literature of Chicano and Puerto Rican writers written in Spanish and produced in the United States in light of their traditions and of contemporary interdisciplinary theories.

SPAN 560. INTRODUCTION TO THE LINGUISTIC STUDY OF SPANISH.
Class 3, cr. 3.
Must be preceded by SPAN 365 and 261, or equivalent preparation.
Principles of phonetics, phonemics, and syntax as applied to Spanish. Brief introduction to general and historical linguistics.

SPAN 581. SPANISH CULTURE.
Class 3, cr. 3.
The development of the cultural life of the Spanish people, as reflected in the geography, history, music, art, and architecture of Spain. Lectures in Spanish.

SPAN 582. LATIN AMERICAN CIVILIZATION.
Class 3, cr. 3.
An outline of Latin American history; the cultural heritage from Spain and from the pre-Spanish civilizations; the intellectual, social, and cultural progress of the Latin American countries. Lectures in the language.

SPAN 590. DIRECTED READING IN SPANISH.
Cr. 1-4.
Prerequisite: consent of head of department.
(May be repeated for credit.)

SUPERVISION

SPV 252. HUMAN RELATIONS IN SUPERVISION.
Class 3, cr. 3.
Study of the basis and organization of individual and group behavior. Special emphasis on typical supervisory relationships.

SPV 303. SUBSTANCE ABUSE IN THE WORKPLACE.
Class 3, cr. 3.
Overviews alcohol and drug problems affecting job performance in the workplace. Topics covered include current concepts of alcoholism and addictions, supervisors' role and responsibilities, work behavior of alcohol and drug abusers. constructive confrontation and intervention, employee assistance programming and referral.

SPV 330. SAFETY ADMINISTRATION.
Class 3, cr. 3.
A survey of the fundamentals for establishing and managing an effective loss control program. Emphasis is directed toward the coordination of the program with the goals of the organization.

SPV 331. OCCUPATIONAL SAFETY AND HEALTH.
Class 3, cr. 3.
Prerequisite: consent of instructor.
A presentation of those aspects of occupational safety and health which are most essential to the first-line supervisor. Emphasis is placed on developing an understanding of the economic, legal and social factors related to providing a safe and healthful working environment.

SPV 332. FUNDAMENTALS OF INDUSTRIAL HYGIENE.
Class 3, cr. 3.
Prerequisite: Consent of instructor.
An examination of the industrial hygiene factors instrumental in maintaining a safe and healthful workplace. Special emphasis is given to the recognition, evaluation and control of occupational health hazards.

SPV 333. SAFETY LAWS, CODES AND STANDARDS.
Class 3, cr. 3.
Prerequisite: Consent of instructor.
A study of the various laws, codes and standards which affect the safety field. Emphasis is placed on an in-depth study of the Occupational Safety and Health Act (OSHA) and the applicable standards therein.

SPV 334. FIRE PROTECTION & STORAGE OF HAZARDOUS MATERIALS.
Class 3, cr. 3.
A study of the fundamentals, principles and tools for dealing with fire and/or hazardous materials. Special emphasis is placed on the recognition, evaluation and control of these hazards.

SPV 350. APPLIED CREATIVITY FOR BUSINESS AND INDUSTRY.
Class 3, cr. 3.
A study of the ways an individual can become more creative and how they can develop an environment which encourages creativity from employees.

SPV 363. PMA-A SYSTEM OF SELF-MANAGEMENT.
Class 3, cr. 3.
This course presents and examines the principles of success researched and developed by Dr. Napoleon Hill. It will provide a framework for students to better understand life's opportunities and the need for definiteness of purpose.

SPV 368. PERSONNEL LAW.
Class 3, cr. 3.
A study of employment laws specially affecting employer-employee relationships. The purpose of the course is to provide the supervisor with a summary of current employee relations laws and a practical approach to dealing with daily employer-employee legal concerns. Topics include laws related to discrimination based on sex, race, age and handicap, hiring and discharge of workers, drug and alcohol testing, privacy in the workplace, wages, ERISA, and other issues on employee rights and employer responsibilities.

SPV 374. SUPERVISION MANAGEMENT
Class 3, cr. 3.
Introduction to and overview of the fundamental concepts of supervision. Emphasis is placed on the supervisor's major functions and essential areas of knowledge, his relations with others and his personal development.

SPV 375. BASIC METHODS OF TRAINING FOR SUPERVISORS.
Class 3, cr. 3.
Prerequisite: SPV 374 or consent of instructor.
Principles, practices, and variations of basic methods of instruction as related to training situations found in the world of work. Emphasis on the supervisor as a trainer.

SPV 376. SUPERVISION AND PERSONNEL PROBLEMS.
Class 3, cr. 3.
Prerequisite: SPV 374 or consent of instructor.
Analysis and discussion of selected case problems concerning typical personnel situations faced by the supervisor. Emphasis directed toward development of student attitude, philosophy, analytical ability and problem solving skills within the working environment.

SPV 399. SUPERVISION TOPICS.
Class 1-3, cr. 1-3.
Hours and subject matter to be arranged by staff.
(May be repeated for credit.)

SPV 433. EQUIPMENT AND MACHINERY SAFETY.
Class 3, cr. 3.
A comprehensive survey of equipment and machinery system safety. Hazardous conditions with corresponding control measures are evaluated in various situations.

SPV 462. WORK EXPERIENCE SEMINAR.
Class 3, cr. 3.
Prerequisite: work experience approved by department.
Class instruction and discussion related to individual participant's work experience.

SPV 472. SEMINAR IN SAFETY.
Class 3, cr. 3.
Prerequisite: At least nine hours of safety related courses.
An examination of various topics which are relevant to the safety

field. Case studies of unique and/or special safety problems, current events relating to safety, and ethics in safety are areas emphasize.

SPV 474. CONFERENCE LEADERSHIP TRAINING.
Class 3, cr. 3.
Understanding the role of the conference in the world of work, with practical applications of the various techniques of conference leadership, and an understanding of group dynamics in the conference situation.

SPV 477. DISPUTE RESOLUTION.
Class 3, cr. 3.
A study of the alternative means of settling political and personal disputes between/among parties by methods generally outside the traditional court systems. Students will investigate the theoretical and practical aspects of communication, negotiation, mediation, arbitration, and other third party strategies to reach agreements.

SPV 567. SUPERVISED FIELD PRACTICE IN INDUSTRIAL TRAINING.
Cr. 3.

SPV 574. MANAGERIAL TRAINING AND DEVELOPMENT.
Class 3, cr. 3.
Review of current managerial education and development theories and practices; discussion of fundamental social, economic and political changes affecting business and the work of managing; implications of these changes for individual manager development and continued growth.

SPV 577. ORGANIZATION AND ADMINISTRATION OF TRAINING AND DEVELOPMENT.
Class 3, cr. 3.
The function and management of training and development in the world or work.

SPV 590. INDIVIDUAL RESEARCH PROBLEMS IN SUPERVISION AND PERSONNEL.
Cr. 1-6.
Consent of department required.
Opportunity to study specific problems in the field of supervision and personnel under the guidance of a qualified faculty member within the department. Does not include thesis work.

STATISTICS

STAT 301. ELEMENTARY STATISTICAL METHODS I.
Class 3, cr. 3.
Prerequisite: MA 148 with C or better.
A basic introductory statistics course with applications shown to various fields and emphasis placed on assumption, applicability, and interpretations, or various statistical techniques. Subject matter includes frequency distributions, descriptive statistics, elementary probability, normal analysis of variance, with emphasis on distribution applications, sampling distribution, estimation, hypothesis testing and linear regression.

STAT 490. TOPICS IN STATISTICS FOR UNDERGRADUATES.
Cr. 1-5.
Supervised reading and reports in various fields. Open only to students with the consent of the department.

STAT 502. EXPERIMENTAL STATISTICS II.
Class 3, cr. 3.
Prerequisite: STAT 501 or equivalent with C or better.
Continuation of STAT 501. Subject matter includes multiple regression and analysis of variance, with emphasis on statistical inference and applications to various fields.

STAT 511. STATISTICAL METHODS.
Class 3, cr. 3.
Prerequisite: MA 261 with C or better.
Descriptive statistic; elementary probability; sampling distributions; inference, testing hypotheses, and estimation; normal, binomial, Poison, hypergeometric distributions; one way analysis of variance; contingency tables; regression.

STAT 512. APPLIED REGRESSION ANALYSIS.
Class 3, cr. 3.
Prerequisite: STAT 511 or STAT 517 with C or better.
Inference in simple and multiple linear regression, residual analysis, transformations, polynomial regression, model building with real data, nonlinear regression. One-way and two way analysis of variance, multiple comparisons, fixed and random factors, analysis of covariance. Use of existing statistical computer programs.

STAT 513. STATISTICAL QUALITY CONTROL.
Class 3, cr. 3.
Prerequisite: STAT 516 or STAT 511 with C or better.
A strong background in control charts including adaptations, acceptable sampling for attributes and variable data, standard acceptance plans, sequential analysis, statistics of combinations, moments and probability distributions, applications.

STAT 516. BASIC PROBABILITY AND APPLICATIONS.
Class 3, cr. 3.
Prerequisite: MA 164 or 224 or equivalent with C or better. MA 261 desirable.
A first course in probability intended to serve as a foundation for statistics and other applications.
Intuitive background; sample spaces and random variables; joint, conditional, and marginal distributions; special distributions of statistical importance; moments and moment generating functions; statement and application of limit theorems; introduction to Markov chains.

STAT 517. STATISTICAL INFERENCE.
Class 3, cr. 3.
Prerequisite: STAT 516 or STAT 519 with C or better.
A basic course in statistical theory covering standard statistical methods and their applications.
Estimation including unbiased, maximum likelihood and moment estimation; testing hypothesis for standard distributions, and contingency tables; confidence intervals and regions; introduction to nonparametric tests and linear regression.

STAT 519. INTRODUCTION TO PROBABILITY.
Class 3, cr. 3.
Prerequisite: MA 362 or MA 510 with C or better.
Algebra of sets, sample spaces, combinatorial problems, independence, random variables, distribution function, moment generating functions, special continuous and discrete distributions, distribution of a function of a random variable, limit theorems.

STAT 528. INTRODUCTION TO MATHEMATICAL STATISTICS.
Class 3, cr. 3.
Prerequisite: STAT 519 with C or better.

Distribution of mean and S in normal samples, sampling distributions derived from the normal distribution, Chi square, t and F. Distribution of statistics based on ordered samples. Asymptotic sampling distributions Introduction to multivariate normal distribution and linear models. Sufficient statistics, maximum likelihood, least squares, linear estimation, other methods of point estimation, and discussion of their properties, Cramer-Rao inequality and Rao-Blackwell theorem. Tests of statistical hypotheses, simple and composite hypotheses, likelihood ratio tests, power of tests.

STAT 532. ELEMENTS OF STOCHASTIC PROCESSES.
Class 3, cr. 3.
Prerequisite: STAT 519 with C or better.
A basic course in stochastic models, including discrete and continuous time Markov Chains and brownian motion, as well as an introduction to topics such as Gaussian processes, queues, epidemic models, branching processes, renewal processes, replacement, and reliability problems.

SOCIAL WORK

SWRK 261. INTRODUCTION TO SOCIAL WORK.
Class 3, cr. 3.
(Not open to students with credit in SOC 261.)
Provides a basic overview of the profession of social work—its development as a profession, professional values and ethics, and the multiple settings in which social work is practiced. Instruction is given in the types of social work; i.e., the generic complex which results in individual casework, group work, community practice, administration, and policy. Methods of social work are described, along with the current frameworks for social work practice, including systems and problem solving.

SWRK 361. THE FIELD OF SOCIAL WORK.
Class 3, cr. 3.
Prerequisite: SOC 100 or equivalent.
(Not open to students with credit in SOC 361.)
Basic concepts and activities of social service organizations. Field trips to selected institutions.

SWRK 364. CHILD AND FAMILY WELFARE.
Class 3, cr. 3.
Prerequisites: SWRK 261, PSY 361, and PSY 362.
(Not open to students with credit in SOC 364.)
A review of the family as it is influenced by societal and personal forces. The impact of culture, society, and economics on the family is reviewed: additionally, the personal and interpersonal factors, including family crises, breakdowns, unemployment, and alcoholism, are considered.

SWRK 462. FIELD PRACTICUM IN SOCIAL WORK I.
Class 4, cr. 4.
(Not open to students with credit in SOC 462.)
Observation and supervised participation in local social welfare agencies. Readings and class meetings to integrate theory and experience. Intended for students who wish to enter graduate school of social work or who plan to become employed in a public welfare agency upon receiving the bachelor's degree.

SWRK 463. FIELD PRACTICUM IN SOCIAL WORK II.
Class 1, cr. 5.
Prerequisite: SWRK 462.
(Not open to students with credit in SOC 463.)
Continuation of SWRK 462. Provides an expanded field experience and seminar for integration of theory with practice. This course requires a minimum of twelve hours of field work per week.

SWRK 465. SOCIAL WORK STRATEGIES AND TECHNIQUES.
Class 3, cr. 3.
Prerequisite: SWRK 261. Strongly recommended enrollment concurrent with SWRK 462.
(Not open to students with credit in SOC 465.)
Emphasis on preparing students for the multiple roles and functions attending social work. Strategies for gathering, organizing, and interpreting social work information, preparation of reports, coordination of referrals and services. Instruction in effective social work techniques.

SWRK 466. HUMAN SERVICES AND INTERPERSONAL SKILLS.
Class 3, cr. 3.
Prerequisite: SWRK 462 or consent of instructor. Strongly recommend enrollment concurrent with SWRK 463.
(Not open to students with credit in SOC 466.)
This course provides a concrete introduction to principles of interpersonal relations in the field of human services. These principles are approached inductively, using field work experiences as a basis for group-based self-analysis and reflection.

SWRK 562. PUBLIC SOCIAL SERVICES.
Class 3, cr. 3.
Prerequisites: SOC 100, 312, or equivalent.
Activities and responsibilities of governmental agencies in meeting social needs. Emphasis on changing philosophies and changing social values, together with their implementation into these services.

THEATER

THTR 136. REHEARSAL AND PERFORMANCE I.
Class 0, Lab. 2, cr. 1.
(May not be taken concurrently with THTR 168, 336, or 368. Repeatable once for credit.)
Prerequisite: consent of instructor.
Study and practice of rehearsal techniques of stage performance. Students will be assigned to acting or other rehearsal activities during semester's major production.

THTR 168. THEATRE PRODUCTION I.
Class 0, Lab. 2, cr. 1.
(May not be taken concurrently with THTR 136, 336, or 368. Repeatable once for credit.)
Prerequisite: consent of instructor.
Study and application of aspects of theatre production. Practice in various production skills. Students will be assigned to positions in semester's major production.

THTR 201. THEATRE APPRECIATION.
Class 2, Lab. 2, cr. 3.
Understanding and appreciation of the theatre's role in the modern world, including a survey of dramatic structure and analysis, and the functions of the actor, director, designer, and critic related to current stage productions. Laboratory work includes attendance and discussion of the dramatic presentations on campus.

THTR 230. ACTING I.
Class 1, Lab. 3, cr. 2.
(Should not be taken concurrently with THTR 340.)
Training and exercise in the basic elements of acting and the use of the stage. Study of historical and theoretical backgrounds of acting and of different types of plays and staging.

THTR 255. STAGECRAFT FOR SECONDARY SCHOOLS.
Class 1, Lab. 6, cr. 3.
(Students will be required to accept one University Theatre production responsibility; two of the six laboratory hours will be reserved for this work.)
Study of the organizational structure of technical aspects of theatre. Training in planning, executing, painting, and lighting scenery for the stage. Study of the forms of scenery and common physical attributes of the stage. The study of the above area is supplemented by extensive practical work in each field.

THTR 330. ACTING II.
Class 1, Lab. 3, cr. 2.
Prerequisite: THTR 110, 120, 130, and/or consent of instructor.
(Should not be taken concurrently with THTR 255 or 340.)
Continued training and exercise in the basic elements of acting, including prose dialogue and sight reading; beginning work in role and script analysis; rehearsal in simple scenes. Advanced exercises in believability, observation, and the sense-memory-recall leading to characterization.

THTR 336. REHEARSAL AND PERFORMANCE II.
Class 0, Lab. 2, cr. 1.
(May not be taken concurrently with THTR 136, 168, or 368. Repeatable once for credit.)
consent of instructor.
Advanced study and practice of rehearsal techniques of stage performance. Students will be assigned to acting or other rehearsal activities during semester's major production.

THTR 340. INTRODUCTION TO PLAY PRODUCTION AND DIRECTION.
Class 2, Lab. 2, cr. 3.
Prerequisite: THTR 225.
(Should not be taken concurrently with THTR 230 or THTR 330.)
A basic study of directing and administration of play production in the high school: audience analysis, play selection, play lists, play analysis, casting, directing procedures, rehearsal and performance techniques, promotion and publicity, interdepartmental cooperation, and the school dramatic organization. Laboratory application of direction practice.

THTR 341. EXPERIMENTAL THEATRE: DIRECTION.
Class 0, Lab. 4, cr. 2.
Prerequisite: THTR 340 or equivalent and consent of instructor.
Practical application of play selection and techniques used in directing for performance. Student will direct a full-length play in the experimental season.

THTR 342. EXPERIMENTAL THEATRE: TECHNICAL.
Class 0, Lab. 4, cr. 2.
Prerequisite: THTR 255 or equivalent, and consent of instructor.
Practical application of technical design for the stage. Student will direct all technical aspects of a full-length play in the experimental season.

THTR 355. AMERICAN MUSICAL THEATRE.
Class 3, cr. 3.
(Identical to MUS 355.)
A study of the origins, history, artistry, and unique qualities of American Musical Theatre.

THTR 360. SCENIC DESIGN.
Class 1, Lab. 4, cr. 3.
Prerequisite: THTR 225 or 340 or consent of instructor.
A basic study of the theories and practices in the application of three-dimensional design to the stage.

THTR 368. THEATRE PRODUCTION II.
Class 9, Lab. 2, cr. 1.
(May not be taken concurrently with THTR 136, 168, or 336. Repeatable once for credit.)
Prerequisite: consent of instructor.
Advanced study and application of aspects of theatre production. Practice in various productions skills. Students will be assigned headships in various divisions of duties during the semester's major production.

THTR 399. THEATRE TOUR.
Lab. 4, cr. 2.
Prerequisite: consent of instructor.
(May be taken concurrently with A&D 399 and/or MUS 399. May be repeated for credit if sites visited are different.)
A course designed to expose to students the theatrical works and historical sites of theatrical interest outside the immediate area. The theatrical world will be observed in relation to the worlds of art and music.

THTR 530. ADVANCED ACTING.
Class 2, Lab. 8, cr. 5.
Prerequisite: THTR 130, 230, and/or consent of instructor.
Advanced work in role and script analysis and character development, including study and practice in difficult prose and verse dialogue reading; intensive study of internal and external aspects of characterization, interaction, and ensemble playing; rehearsal in complex scenes; and participation in one play.

THTR 534. CHILDREN'S CREATIVE DRAMATICS.
Class 2, Lab. 2, cr. 3.
Principles of creativity as used in improvision and dramatization. Methods of relating these to children's experiences and children's literature. Direct application of the learning through supervised activity with elementary or junior high students.

THTR 590. DIRECTED STUDY OF SPECIAL THEATRE PROBLEMS.
Cr. 1-3.
Admission by consent of instructor.
(May be repeated once for credit.)
An individualized and intensive study of any aspect of theatre required by the student's plan of study.

WOMEN'S STUDIES

WOST 121. INTRODUCTION TO WOMEN'S STUDIES.
Class 3, cr. 3.
An introduction to a women's studies perspective in various academic disciplines. Emphasis on the socialization process of women, the history and literature of women, the politics and theory of the women's rights movement, and the changing role of women in society. (Same as GS 121.)

WOST 210. GENDER AND STYLE IN LITERATURE.
Class 3, cr. 3.
This introductory course compares vaious kinds of discourse written by women with that written by men. Students will read paired works in such literary genres as the maturation novel, autobiography, personal

essay, short stories, poetry, and drama. The class will explore the aesthetic, cultural, and experiential differences and commonalities evidenced by these writers. (Same as ENGL 210.)

WOST 232A. MOTHERS AND DAUGHTERS IN LITERATURE.
(Same as ENGL 232A.)

WOST 232B INTERNATIONAL WOMEN'S LITERATURE.
(Same as ENGL 232B.)

WOST 320 BY AND ABOUT WOMEN.
Class 3, cr. 3.
This literature course will emphasize significant texts by major women writers such as Atwood, the Brontes, Cather, Chopin, Dickinson, Eliot, Glaspell, Hurston, Jewett, Lessing, Mansfield, Morrison, Oates, Rich, and Woolf. Although the class will study mainly 19th and 20th century English and American writers, the readings will not be restricted to these. In addition, the readings will also include a variety of literary genres—novel, short fiction, poetry, and drama. (Same as ENGL 320.)

WOST 344. HUMAN SEXUALITY.
Class 3, cr. 3.
Prerequisite: PSY 120 or SOC 100.
A nonjudgmental approach to the study of sexuality through attempts to bring to students' awareness their own sexual values. Topics include evaluation of research, biological aspects, varieties of expression, inadequacies, violence, love, erotica, gender identity, aging, and sex laws. (Same as PSY 344.)

WOST 349. PSYCHOLOGY OF WOMEN.
Class 3, cr. 3.
Prerequisite: PSY 120.
An examination of the history and sources of concepts which have defined the psychological functioning of women and a critical evaluation of current evidence regarding women and their behavior, examining the influences which affect them in contemporary society, as set within the context of the life cycle. (Same as PSY 349.)

WOST 350. SOCIAL PSYCHOLOGY OF MARRIAGE.
Class 3, cr. 3.
Prerequisite: SOC 100 or 312, or equivalent.
(Not open to students who have had CDFS 350.)
Designed to provide an understanding of contemporary courtship, marriage, and family interaction as cultural, social, and social-psychological phenomena. Consideration of the major sources of marital strain and conflict within a heterogeneous, rapidly changing society. (Same as SOC 350.)

WOST 365. WOMEN IN AMERICA.
Class 3, cr. 3.
A survey of the history of women in America from Colonial times to the present. Emphasis is on changing status of women, social and cultural influences, movements for women's rights and women's contributions to American society. (Same as HIST 365.)

WOST 405. REHTORIC OF WOMEN'S RIGHTS.
Class 3, cr. 3.
Prerequisite: COM 114.
An analysis of the major arguments and persuasive techniques used in the American women's movement and continuing through the current struggle for equal rights. Included will be major speeches as well as non-oratorical forms of rhetorical messages. (Same as COM 405.)

WOST 450. SEX ROLES IN MODERN SOCIETY.
Class 3, cr. 3.
Prerequisite: SOC 350 or consent of instructor.
A critical examination of the complementary roles of men and women with particular attention to problems of role adjustment in the contemporary United States. The neofeminist movement and countermovements. Role conflicts and adjustments in such areas as family, education, employment, and the political area. (Same as SOC 450.)

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CALENDAR 1991-1992, 1992-1993

Fall 1991

Mon	Aug 19	Fall semester begins
Sat	Aug 24	Classes begin
Mon	Sept 2	Labor day (no classes)
Tues	Nov 26	Thursday classes meet
Wed	Nov 27	Friday classes meet
Thurs	Nov 28	Thanksgiving recess begins
Sun	Dec 1	Thanksgiving recess ends
Wed	Dec 11	Classes end
Thurs	Dec 12	Final exams begin
Wed	Dec 18	Final exams end
Sun	Jan 5	Fall semester ends

Fall 1992

Mon	Aug 24	Fall semester begins
Sat	Aug 29	Classes begin
Mon	Sept 7	Labor Day (no classes)
Tues	Nov 24	Thursday classes meet
Wed	Nov 25	Friday classes meet
Thurs	Nov 26	Thanksgiving recess begins
Sun	Nov 29	Thanksgiving recess ends
Wed	Dec 16	Classes end
Thurs	Dec 17	Final exams begin
Wed	Dec 23	Final exams end
Sun	Jan 10	Fall semester ends

Spring 1992

Mon	Jan 6	Spring semester begins
Sat	Jan 11	Classes begin
Mon	Jan 20	Martin Luther King, Jr Day (no classes)
Mon	Mar 23	Spring recess begins
Sun	Mar 29	Spring recess ends
Mon	May 4	Classes end
Tues	May 5	Final exams begin
Mon	May 11	Final exams end
Sun	May 17	Commencement
Sun	May 17	Spring semester ends

Spring 1993

Mon	Jan 11	Spring semester begins
Sat	Jan 16	Classes begin
Mon	Jan 18	Martin Luther King, Jr Day (no classes)
Mon	Mar 22	Spring recess begins
Sun	Mar 28	Spring recess ends
Mon	May 10	Classes end
Tues	May 11	Final exams begin
Mon	May 17	Final exams end
Sun	May 23	Commencement
Sun	May 23	Spring semester ends

Summer 1992

Mon	May 18	Summer term begins
Mon	May 18	Classes begin
Mon	May 25	Memorial Day (no classes)
Sat	July 4	Independence Day (no classes)
Thurs	Aug 5	Classes end
Sun	Aug 16	Summer term ends

Summer 1993

Mon	May 24	Summer term begins
Mon	May 24	Classes begin
Mon	May 31	Memorial Day (no classes)
Sun	July 4	Independence Day
Thurs	Aug 12	Classes end
Sun	Aug 22	Summer term ends

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Educational Material